THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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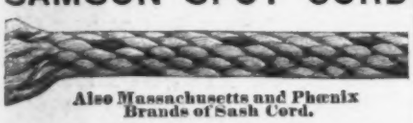

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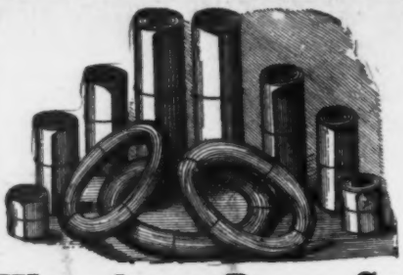

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THE IRON AGE

THURSDAY, JANUARY 24, 1901.

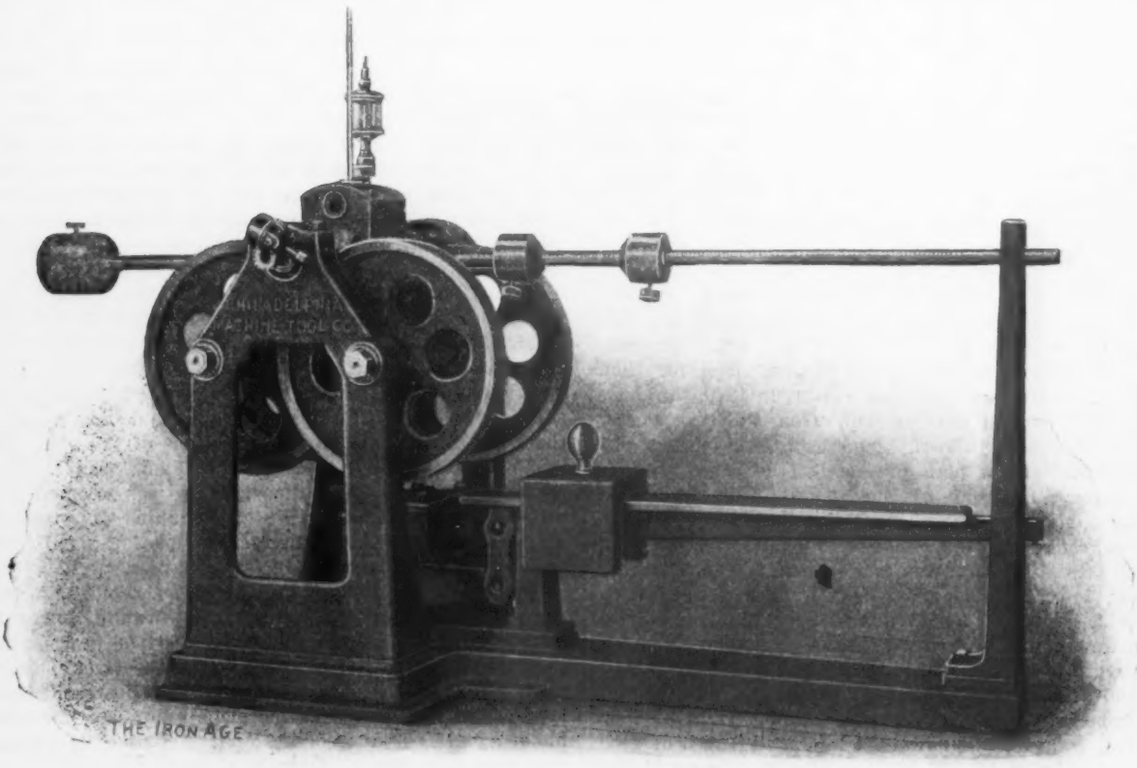
The Philadelphia Oil and Bearing Metal Testing Machine.

The users of lubricating oils and bearing metals have been trying for a long time to solve the problem presented to them when they desire to make an efficient test of the various kinds offered. Elaborate and expensive tests of oils have failed to give even a fair idea of their lubricating value under working conditions. Many chemical and mechanical tests have been tried only to be condemned. Various machines have been designed and thoroughly tried. The general conclusion of testing engineers is that the main test for a lubricating oil should be in a machine in which the conditions of practice are complied with as nearly as possible, and all influences affecting the scientific results which are not a legitimate part of the test are eliminated.

The machine here illustrated was designed and built by the Philadelphia Machine Tool Company, 443 North Darien street, Philadelphia. The machine may be analyzed into three essential features, and the additional mechanism necessary to connect these three elements and make an efficient machine. These three elements are the axle, which forms for part of its length the journal on which the oil or bearing metal is to be tested; the load beam, by means of which any load up to 1200 pounds may be put upon the bearing, and the coefficient beam, which has the yoke carrying the bearing for test incorporated in it, and which accurately measures the friction generated between the journal and bearing.

To form these elements into a compact and efficient machine there has been provided in the first place a heavy rigid frame underlying the whole and making it self contained. To avoid heating of the axle from any other cause than the friction of the test journal, it is mounted on four large wheels, on which it rolls, thus avoiding all sliding friction. The load is carried to the bearing through a carefully designed series of balancing levers carried on hardened steel knife edges, and the series so designed that the sensitiveness of the coefficient beam is not affected. The axle is hollow, permitting of the circulation of water or steam when it is desired to control the temperature. The temperature is measured by a thermometer introduced at the top of the yoke and brought close down to the bearing. Lubrication can be effected by a drop feed oil cup or by an oiled pad held against the under surface of the journal by a spring. The revolutions are read from a counter which can be thrown in or out of gear as desired. Reference to the cut will elucidate most of these points.

In operation this machine has proved a very sensitive and accurate weigher of the friction on the test journal, and therefore gives the true value of a lubricant or bearing metal under the conditions prevailing in practice. The beam floats as in machines where the beam weighs a direct pull. It is sensitive to and easily read to ½ pound.



THE PHILADELPHIA OIL AND BEARING METAL TESTING MACHINE.

Southeastern Texas is widely excited over a remarkable oil strike made last week near Beaumont, on land owned by Capt. A. F. Lucas. The oil was struck at a depth of less than 1000 feet. Its yield is reported to be fully 16,000 barrels a day. Lands in the vicinity of the well that were worth less than $2 an acre a week ago are now held at $1000 an acre.

The Crown Smelting Company of Chester, Pa., are now busily engaged in casting four large brass blades for a screw propeller for the United States Army transport "McClelland," now undergoing repairs at the Brooklyn Navy Yard. When completed the new propeller will be 16 feet in diameter.

The Development of Power at Niagara Falls.

A very important and thoroughly interesting paper on the history of the earliest development of power known to have been made at Niagara Falls has been prepared by Arthur Schoellkopf, who is at the head of the Niagara Falls Hydraulic Power & Mfg. Company, owners of the hydraulic canal power, which is the oldest development at the Falls.

In this paper Mr. Schoellkopf has pointed out how the company are now operating their central station under a head of water which a few years ago it was thought impossible to use, because of the apparent inability to build wheels that would withstand the strains of such a head. The Niagara Falls Hydraulic Power & Mfg. Company are now operating their turbines under a head of 210 feet, and in what Mr. Schoellkopf has said, he not only has told all about the Niagara development, but he has incidently and indirectly outlined in an exceedingly plain way, by the object lesson presented by his company's development, the wonderful progress that makers of turbines have made in the past 20 years in meeting the requirements of just such wonderful developments and projects as those at Niagara Falls.

It has been the ambition of the engineers and laymen from the time Niagara Falls was discovered to utilize its vast energy for power purposes. The first occasion which we learn of any part of the water power of the Niagara being put to practical use is in the year 1750. when French settlers built a small saw mill on the river bank, opposite Goat Island. History does not inform us in just what manner the power was utilized, but undoubtedly their machinery was of the most primitive description. Again, in 1810, D. Clinton, and, in 1825, Lafayette, utilized some of this power. From this time, as the wants of the increasing population made it necessary, other mills and manufacturing establishments were erected on a small scale. It remained for Gen. Peter B. Porter and Augustus Porter, in 1840, to devise a practical plan of development. Gen. Peter B. Porter died in 1844, and in 1847 Augustus Porter isued a circular describing a plan practically the same as that now being carried out by the Niagara Falls Hydraulic Power & Mfg. Company.

The grounds for this canal were donated by the heirs of the late Hon. Augustus S. Porter and Gen. Peter B. Porter, in 1852. Negotiations were commenced with Caleb J. Woodhull and Walter Bryant, and an agreement was finally reached with these gentlemen by which they were to construct the canal. They received a plot of land at the head of the canal having a frontage on the upper river of about 600 feet, and a right of way 100 feet wide for a canal along its entire length of 4400 feet, which now is through the most thickly populated part of the city. They were also given about 75 acres of land near its terminus, having a frontage on the river below the falls of nearly a mile.

In March, 1853, the Niagara Falls Hydraulic Company were incorporated, with Caleb J. Woodhull as president and Walter Bryant as agent. This company at once made a contract for the construction of a canal 70 feet wide and 10 feet deep, with wharves at its connection with the river. Work seems to have been begun promptly and carried on for about 16 months. It was then suspended for lack of funds until 1858, when it was carried on for a time by the Niagara Falls Water Power Company, Stephen M. Allen, president. A short time afterward Horace H. Day acquired the property, and July 1, 1861, completed a canal 36 feet wide and about 8 feet deep. The war of the rebellion broke out at this time, followed by years of business depression. No use was made of the canal until 1870, when Charles B. Gaskill built a small grist mill on the site of the present flouring mill belonging to the Cataract Milling Company, of which Mr. Gaskill was president.

In 1877 the canal and all its appurtenances were purchased by Jacob F. Schoellkopf of Buffalo and Abram Chesbrough of La Salle, N. Y., who organized the Niagara Falls Hydraulic Power & Mfg. Company, of which Mr. Schoellkopf was president up to the time of his death, September 15, 1899, and Arthur Schoellkopf, secretary and treasurer. Since that time the enlarging of the canal and the development of electrical and hydraulic power has gone steadily forward, mainly through the indomitable energy of Jacob F. Schoellkopf and his great faith in the future of this great water power and the location of Niagara Falls up to the time of his death.

The mills of Schoellkopf & Mathews, Cataract Milling Company, Central Milling Company, Pettebone-Cataract Paper Company, the City Water Works and the Niagara Wood Paper Company leased the right to draw a certain quantity of water from the canal, construct their own wheel pits and install their own water wheels.

Two different methods were adopted for constructing the pits for these various mills. In some cases shafts were sunk into the rock back from the edge of the bank, in which the wheels were placed, and a tunnel driven from the bottom of the shaft to the face of the bank for a discharge of the water after it had passed through the wheels. In other cases a slot was cut in the face of the bank, in which wheels were placed. In all cases turbine wheels of different make running on vertical axes were used.

In 1881 the Niagara Falls Hydraulic Power & Mfg. Company installed their first plant for the purpose of supplying power to customers, the power to be delivered mechanically at their mills. The method adopted was as follows: A shaft 20 x 40 feet and 80 feet deep was sunk 200 feet back from the face of the high bank, and from this shaft a tunnel was driven to the face of the bank from a tail race. The water was conducted to the bottom of this shaft in iron penstocks and used on two different turbines running on vertical axes, from which the power was transmitted to the different factories.

Mr. Porter's contract with Messrs. Woodhull and Bryant only conveyed the land to the edge of the high bank and did not include the talus or slope between the edge of the high bank and the river, and only granted the right to excavate down to the face of the bank 100 feet. At that time it was not considered that higher heads would ever be utilized, as it was deemed unwise to construct water wheels to stand a pressure of a higher head, and, in fact, none of the mills attempted to utilize more than 50 or 60 feet.

Hydraulic engineering advanced so rapidly in the early 80's that the Niagara Falls Hydraulic Power & Mfg. Company, in 1886, secured a deed of portions of the slope between the high bank and the river, having since secured other portions, so that at the present time they are at liberty to use this slope for power purposes under a head of water of 210 feet. A part of this slope was leased to the Cliff Paper Company in 1892, who built a pulp mill at the water's edge of the lower river, developing 2500 horse-power under 120 feet head by using the water discharged from the wheels in the pits constructed by the Hydraulic Power Company in 1881. In 1886 Wallace C. Johnson was appointed chief engineer and has had charge of the engineering work since that time.

The canal as completed by Mr. Day had a capacity of 15,000 horse-power under 100 feet head, but as the water had been used under less heads, its capacity was exhausted in 1892, and only about 7000 horse-power produced. The demand for power increasing, the Niagara Falls Hydraulic Power & Mfg. Company found it necessary to commence an enlargement of their canal, and have continued improving the same up to the present time, which, in 1900, had a capacity of 36,000 horse-power under the full head of 210 feet.

The water for the plant is led from the hydraulic basin in two open canals or flumes to the forebay, 30 feet wide and 22 feet deep, built near the edge of the high bank. From this forebay the water is conducted to the power house by means of three penstock pipes, one of them being 8 feet and the other two 11 feet in diameter, built of flange steel. This plant, with a work-

ing capacity of 30,000 horse-power, is nearly completed. It consists of 14 turbine wheels, from 2000 to 3000 horse-power each, mounted on horizontal axes, with direct current generators coupled to each end. From these generators the current is conducted to the top of the bank by means of wires and bars, in wire towers, built alongside of the penstocks, and thence in underground subways to the various consumers.

The tenants of this company and their manufactured product are as follows:

The Pittsburgh Reduction Company.—Aluminum; now using 6600 horse-power, contracted for 4000 horse-power, total 10,600 horse-power.

The National Electrolytic Company.—Chlorate of potash; now using 2200 horse-power.

Alloy Smelting Company.—Ferro chrome and other alloys; now using 400 horse-power.

Acker Process Company.—Bleaching powder and caustic soda; 3200 horse-power.

B. & N. F. Electric Light & Power Company.—Arc and incandescent lighting; now using 400 horse-power, contracted for 650 horse-power, total 1050 horse-power.

Niagara Silver Company.—Silver ware; 125 horse-power.

Niagara Gorge Railroad Company.—350 horse-power.

Lewiston & Youngstown Electric Railroad.—100 horse-power.

Niagara Falls Brewing Company.—86 horse-power.

Cataract Hair Cloth Company.—Hair cloth; 16 horse-power.

Niagara Frontier Electrical Machine Company.—10 horse-power.

Niagara University.—For electric lighting, &c.; 30 horse-power.

New York State Reservation.—For lighting; 20 horse-power.

Sundry small consumers, 150 horse-power.

Total amount of electric power, 19,037 horse-power.

Mechanical Power.

Carter Crume Company.—Check book factory; 60 horse-power.

Oneida Community, Limited.—Silver plated wares; 300 horse-power.

Total mechanical power, 360 horse-power.

Hydraulic Power.

Cliff Paper Company.—Paper and wood pulp; 2900 horse-power.

Niagara Wood Paper Company.—Wood pulp; 250 horse-power.

City of Niagara Falls Water Works.—150 horse-power.

Niagara Falls Milling Company.—Niagara mill, flour and feed, 900 horse-power; Central mill, flour and feed, 1000 horse-power; total, 1900 horse-power.

Pettebone-Cataract Paper Company.—Paper and wood pulp; 1400 horse-power.

Cataract City Milling Company.—Flour and feed; 400 horse-power.

Total hydraulic power, 7000 horse-power.

The Niagara Falls Hydraulic Power & Mfg. Company are capitalized at $500,000, and their officers are George B. Mathews, Buffalo, president; W. D. Olmstead, Buffalo, vice-president; Arthur Schoellkopf, secretary and treasurer; D. P. Jones, chief engineer, and Wallace C. Johnson, consulting engineer. John L. Romer of Buffalo and J. F. Schoellkopf, Jr., with the above named officers, constitute the Board of Directors.

A successful trial of the Marconi system of wireless telegraphy, made under unusually trying conditions, is reported from Paris. The Belgian steamer "Clementine" crossed from Ostend to Dover on Tuesday in a heavy snow storm with a number of Belgian Government officials on board, for the purpose of making an official test of the system. In spite of the storm messages were regularly exchanged between the "Clementine" and Ostend until the boat drew alongside Dover Pier. Mr. Marconi, it is said, contemplates establishing stations all around the English coast to enable vessels at any distance up to 60 miles from land to communicate with the shore.

The Conciliation Committee.

With the purpose of carrying out the idea proposed by the National Civic Federation, to end forever the disastrous uprisings between capital and labor, the committee appointed by the Chicago Conference on Conciliation and Arbitration December last met on the 12th inst. at the Grand Pacific Hotel.

It is proposed to select a National Board of Arbitration, whose duty it will be to adjust matters so far as it is agreeable between those concerned, and the plan is expected to bring into closer touch the interests of the employer and employed. Several of the members of the committee were absent, and for this reason permanent organization could not be effected, but those who were there suggested plans and outlined a system of procedure which probably will meet the approval of the other members.

After the choice of A. C. Bartlett of the firm of Hibbard, Spencer, Bartlett & Co. for temporary chairman and Ralph M. Easley of the National Civic Federation for temporary secretary, those of the committee who were present got down to work. Representatives of capital and labor worked in harmony in an effort to outline the committee's work. It was the unanimous opinion that both labor and capital must be organized on lines of less friction.

In order that the great mass of laboring men and capitalists who are interested in the deliberations of the committee may be apprised of the work being done and also that they may have a chance to make suggestions from time to time, it is proposed to have a bureau of education and publicity. A monthly pamphlet will be issued. Besides a synopsis of the progress made, the publication will contain a set of questions to be answered by interested parties not members of the committee. Herman Justi, Commissioner of the Illinois Coal Operators' Association; Frederick Driscoll, Commissioner of the American Newspaper Association, and Daniel Keefe, president of the International Longshoremen's Union, were appointed to take this work in charge.

Arrangements will be made at once by Secretary Easley to have printed 20,000 of these pamphlets, to be forwarded to hundreds of employers throughout the country and to the 600 or more labor organizations. In addition to the pamphlet it was the sentiment of those at the meeting that each should notify his associates in business and the labor world of the proposed plans of the committee and its ideas on arbitration.

The members of the committee deem it best that no force should be used to compel arbitration. If a national board is selected only such cases are to be taken for it as are previously agreed upon by the employers and labor men interested, and then the decision is not to be binding unless this also shall have been previously agreed to.

At the arbitration and conciliation meeting in December both the labor men and employers were requested to forward a set of queries to men engaged in their lines of trade, with the idea in view of gaining some general idea as to the best plan of choosing members of a National Board of Arbitration.

Many letters were received, and among others read before the committee was one from Edward P. Ripley, president of the Atchison, Topeka & Santa Fé Railroad, which was enthusiastically received. The ideas evinced by Mr. Ripley seemed to find lodgment in the minds of all of those present. Mr. Ripley stated that he did not favor compulsory arbitration, but that he was in sympathy with voluntary agreements in some instances, but not in all. He declared that he favored the most complete organization of railway corporations for self protection in all instances, including relations with organized labor. He favors the appointment of one national arbiter, he to select two others if occasion requires it, and under all circumstances he is in sympathy with organized labor. He says that when conservatively governed it is for the best interest of the labor classes.

A Practical Laboratory.

There is a great difference between the practical application of chemistry where dollars and cents are the main feature and theoretical chemistry, wherein experiment and research are the principal points considered. Each branch of chemistry has its place, and theoretical chemistry is of just as much use and value as practical chemistry. The mistake generally made is in misplacing the two branches.

Every practical foundryman knows that theoretical chemistry in the foundry is not only misleading, but fails to produce the practical results desired. In foundry practice the result aimed at is a soft, close grained iron, with good strength. In addition to this, it is a source of satisfaction to be able to govern the mixture and obtain duplicate melts in the cupola. Practical chemistry combined with good common sense will accomplish wonders, providing the surroundings are harmonious. Harmony between the chemist and the workmen is the keystone of success.

It is not the purpose of this paper to explain such matters, but to describe a modern practical laboratory where harmonious conditions prevail and good results are obtained. In a large corporation the purchasing agent is a prime factor, and as he is the means of distributing thousands, sometimes millions, of dollars in the line of outlay for raw material, it stands to reason that he should be a man of keen discernment, quick decision and shrewd business ability.

In order to distinguish the difference between good, indifferent and poor material a system of tests is a necessary adjunct to the purchasing department. The United States Government maintains a bureau of tests in the form of numerous physical and chemical laboratories. All of the large railway lines, sugar refineries, chemical works, color works, oil refineries, meat packing works, cement works, steel plants, blast furnaces, machine shops and many iron foundries now consider a physical or chemical laboratory an absolute necessity. It is only within the past few years that the agricultural implement manufacturers, engine builders and iron founders have recognized the value of chemistry in their business; some of these institutions now have laboratories that are marvels of completeness.

In the steel plants the only determinations required are iron, steel, ores, fuel and the metalloids associated with iron. In the electrical construction business, it is necessary to test the wire, cotton, paper, &c. In a foundry, pig iron, cast iron, limestone, sea coal facing, sand, &c., are the materials operated on. The large industrial concerns manufacturing agricultural implements are perhaps required to test a greater variety of materials than any of the lines mentioned. Some idea as to the requirements of a laboratory for this purpose may be realized from the fact that such concerns as the McCormick, Deering, Milwaukee, Champion, Osborn, Wood and Plano harvester companies, the Edward P. Allis Company and the J. I. Case Threshing Machine Company are fitted with both physical and chemical laboratories for testing the following materials—viz.: steel, wrought iron, cast iron, bearing metals, alloys, wood, coal, coke, fuel oil, gas, fire brick, limestone, clay, sand, foundry facings, leather, cloth, rubber, paper, rope, twine, chain, lubricants, paints, oils, varnish, &c.

A description of one of these modern laboratories may be interesting, as a great majority of readers are unfamiliar with the inner workings of such an institution.

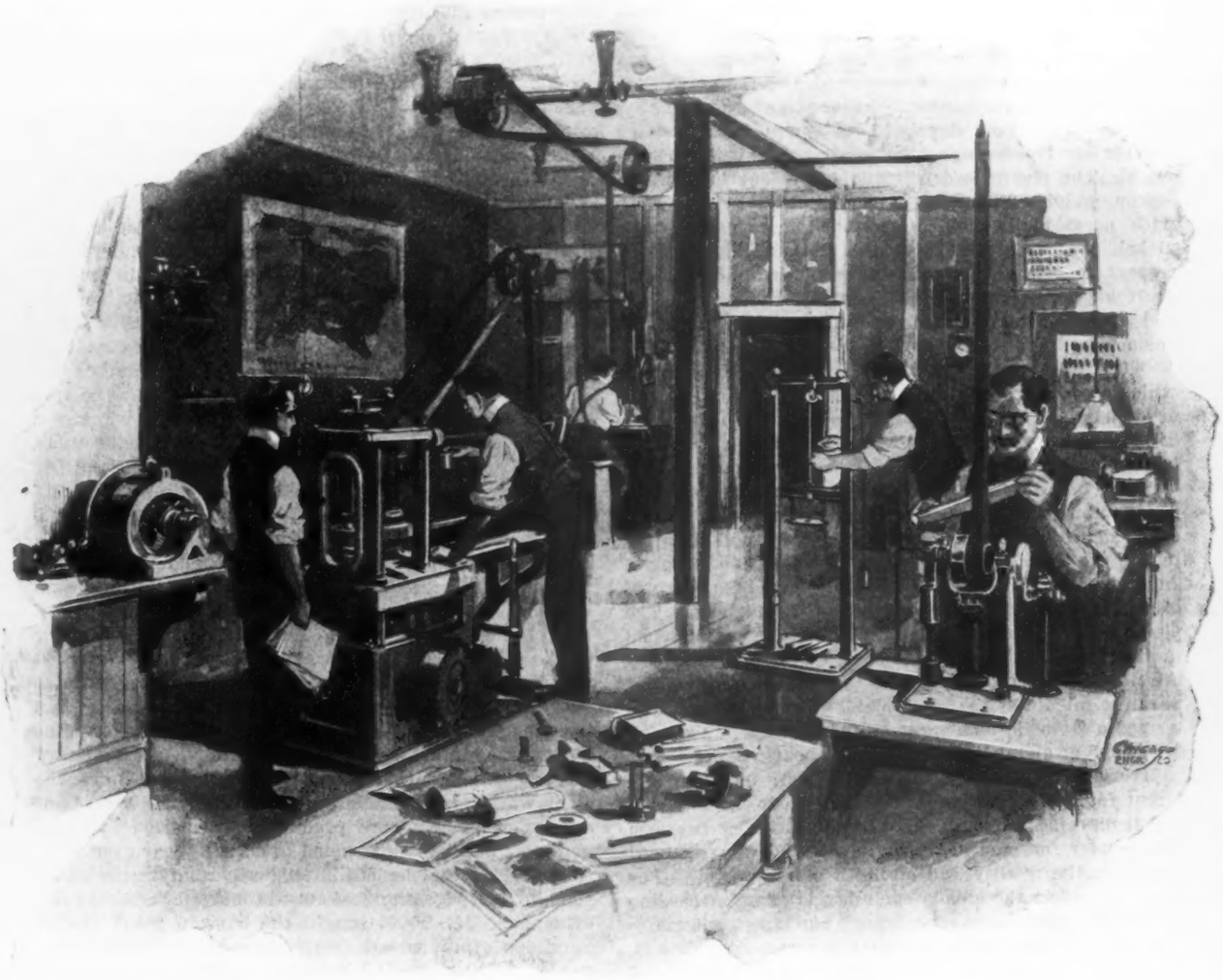
THE CHEMICAL LABORATORY OF THE J. I. CASE THRESHING MACHINE COMPANY.

One of the best equipped establishments of this character is found at the works of the J. I. Case Threshing Machine Company, Racine, Wis. The officers of this company are energetic business men, and hold the following positions: F. K. Bull, president; Frederick Robinson, vice-president and general manager; R. T. Robinson, secretary, and Chas. MacIntosh, treasurer. Stephen Bull, former president of the company and one of the original founders of the now great establishment, still takes a deep interest in the progress of affairs. The head chemist is W. G. Scott.

When the laboratory was first started it was looked upon as a fad or as an experiment. Now, however, it is consulted in all matters pertaining to material; and as all "breakages" are inspected, tested and the reports filed for reference, it furnishes a means of correcting many evils. One pleasant feature in connection with this department is that perfect harmony exists between the chemist and the different foundrymen. The foundry foremen, the mixers, samplers, inspectors and chemists are all working to advance the interests of the firm. Every kind of testing machine and apparatus required for a physical test or chemical analysis will be found here.

Several rooms are devoted to this purpose. The first is known as the office; here are desks, tables, fine weighing apparatus, &c., and here is where the reports are made out and typewritten. Three duplicate reports are made, one to be sent to the general manager, one to the purchasing agent and one to the superintendent, if the report relates to material. If, however, the report applies to breakages or to shop tests, then a report is made out to the manager of agencies or to the foreman of the department in question.

At one side of the room is a large fine library with hundreds of scientific periodicals and trade journals, conspicuous among which is *The Iron Age*. The library embraces the latest and most standard scientific works on every subject connected with the working of raw material for industrial purposes. Chemistry, physics, iron and steel, wood, cloth, cordage, leather, rubber, paper, fuels, oils, paint, &c., are titles showing prominently among the many books in the library. Air pumps, compression pumps, barometers, thermometers, hygrometers for measuring the moisture in the air, anemometers for determining the velocity of air currents, electrical devices for electrolysis of metals, delicate machines for determining the melting point of solid oils and greases, gas apparatus, hydrostatic balances, combustion furnaces, centrifugal machines, apparatus for the analysis of soils, &c., are also found here.



THE PHYSICAL LABORATORY OF THE J. I. CASE THRESHING MACHINE COMPANY.

At one side of the room are two large cases of bottles containing pigments of every color known. These bottles contain samples of dry paint which have been analyzed, and there are nearly 3000 samples of various colors in the rack.

Next is the chemical room, where the fumes and odors, boiling solutions and the heat from small furnaces give one an idea of the inferno. This room is devoted entirely to chemical work. The apparatus, of

which there seems to be no end, is mostly of glass. Fine glass tubes for measuring liquids, apparatus for gas analysis, specific gravity and hydrostatic balances, burettes, pipettes, beakers, flasks, casseroles, evaporating dishes, funnels, suction pumps, Bunsen burners and glass ware blown in the most fantastic shapes imaginable are everywhere. Among the apparatus are numerous small crucibles, some of iron, others of delicate china, a few of solid silver and quite a number of platinum. The platinum crucibles are very expensive, costing more than gold. Those in the Case laboratory are valued at more than $500. A small platinum crucible holding not more than a fluid ounce is worth from $15 to $25, according to weight.

In this room the assistant chemists are always busy with a great many iron analyses, boiling, filtering and drying the various precipitates. This laboratory does the work for several other large concerns in the Northwest, and as every car of pig iron that is purchased has to be analyzed one can form some idea of the magnitude of the business when informed that the average number of iron analyses per day is 16. A complete analysis of iron or steel determines the quality and value of the metal. The elements or metalloids present in iron are silicon, sulphur, phosphorus, manganese and carbon, with occasionally small amounts of copper, cobalt, nickel, titanium, arsenic, &c. A noticeable feature in respect to this room is the drug store appearance of shelves filled with bottles, drawers for dry chemicals and a neat arrangement of everything pertaining to the business.

The third room is termed the physical laboratory, which is perhaps the most interesting section of this department. The machines used for testing the strength of various materials are very expensive, and a shop having a single machine is considered quite fortunate, but here are found quite a number, prominent among which is an automatic screw power testing machine of the latest design. This machine is fitted with appliances for taking the tensile, transverse and compressive strength. An interesting illustration of the strength of a piece of iron 1 inch in diameter is given on this machine. The piece, which is usually about 16 inches long, is fastened in the machine by means of a clamp or grips. When the machine is started the piece of iron is pulled apart near the middle of the piece. This method of testing is termed a "tensile test." An ordinary bar is broken under a load of about 49,000 pounds, or nearly 25 tons.

Every day during the season test bars from the different foundries are sent to the laboratory for a tensile and transverse test, and there is much rivalry between the foundry foremen in trying to see who can come out ahead on the quality and strength of their iron. The iron charged in the cupola each day is mixed according to analysis, and the casting turned out must conform to the specifications under which the foreman is bound. The Case Company are very strict in this respect, and allow the foundryman only 15-100 of 1 per cent. variation on silicon and 1-100 of 1 per cent. on sulphur.

Three grades of gray iron castings are made, and the chemical contents must not only be within a certain limit, but the bars must have a certain strength and the shrinkage held within certain limits. No test bar must have a tensile strength of less than 18,000 pounds, or a tranverse strength of less than 2000 pounds to the square inch. Transverse tests are made on a 12-inch span. The usual average breaking strain is 24,000 pounds for tensile strength and 2500 pounds for the transverse strength. One foundry (Milwaukee Harvester Company) has a yearly record exceeding these figures, in some cases the "soft iron" bars showing a transverse strength of over 3000 pounds. All bars are micrometered and figured to 1 square inch. A complete physical test of cast iron includes the following features or determinations: Tensile strength, transverse strength, deflection, compression, torsional test, chill, shrinkage and drop test.

A tensile test is made on every shipment of rubber and leather belting, chain, rope, &c. The belting test pieces have a pulling section of 1 inch in width, and the average strength per inch of width of single thick belt must not be less than 700 pounds, otherwise the material is rejected. By this means nearly all of the material sent out is known to be good. Occasionally, however, breakages occur in the field, or the material is reported to be poor, in which case it is returned to the laboratory and if found to be defective from an unseen flaw the purchaser is supplied with a new outfit free of charge.

Another interesting machine in this room is a United States standard cloth tester, on which the strength of cotton duck is determined. There are also machines for testing twine, paper, wire and rubber, also a machine for taking the percentage of stretch in rubber. This latter machine determines the amount of shoddy mixed with pure gum. Pure Para rubber has a stretch of 7 to 13 times its own length, while "shoddy" gives only one-tenth to twice its length. Another machine is intended for testing cast iron by means of a shock or the impact of a weight dropped from a given hight. According to Mr. Scott's idea, this test is a very practical one, as it represents the actual punishment a great many castings get in actual use.

Prominent among the great number of testing machines is a Thurston oil tester for determining the practical value of lubricating oils, also a machine for testing babbitt metal; these machines are worked by electricity and register the friction pressure, rise in temperature, speed, &c. A contrivance for determining the hardness of cast iron must not be omitted in this description. This machine is known as the Bauer drill test, and was designed by the late Chas. A. Bauer of Springfield, Ohio. The number of revolutions made by a ⅜-inch drill in boring a hole exactly ½ inch deep determines the hardness of the metal. The harder the iron the more revolutions will the electric counter register. Specimens of iron, steel, alloys, rope, twine, canvas, leather, rubber, paper, &c., are to be seen on the shelves, and each sample thus displayed is marked as a "freak," or in other words, these samples showed some extraordinary results as to strength or curious flaws.

To the vice-president and general manager belongs the credit of creating this branch of the business and bringing it up to its present standard. The secretary of the company is a practical chemist, and acts as director of the laboratory. The president takes a great interest in the laboratory work, and is very particular to have everything in the way of apparatus, &c., up to date, and in connection with the treasurer has spared neither pains nor expense in fitting out this department. If necessary these people send their chemist to the blast furnace, the steel works, paint factory, tannery, rubber works, or any other place where practical information is to be obtained, and he is instructed to actually learn the practical part, so that he can intelligently analyze the material; in this way practical results instead of theory are achieved. Mr. Scott has in the past 15 years visited hundreds of industrial establishments in nearly every part of the country, and is probably as well posted in the making as in the tearing apart of the different kinds of material. A person who understands the manufacturing process, as well as the analytical part, is called a technical or industrial chemist.

The Chicago Sheet Metal Workers.

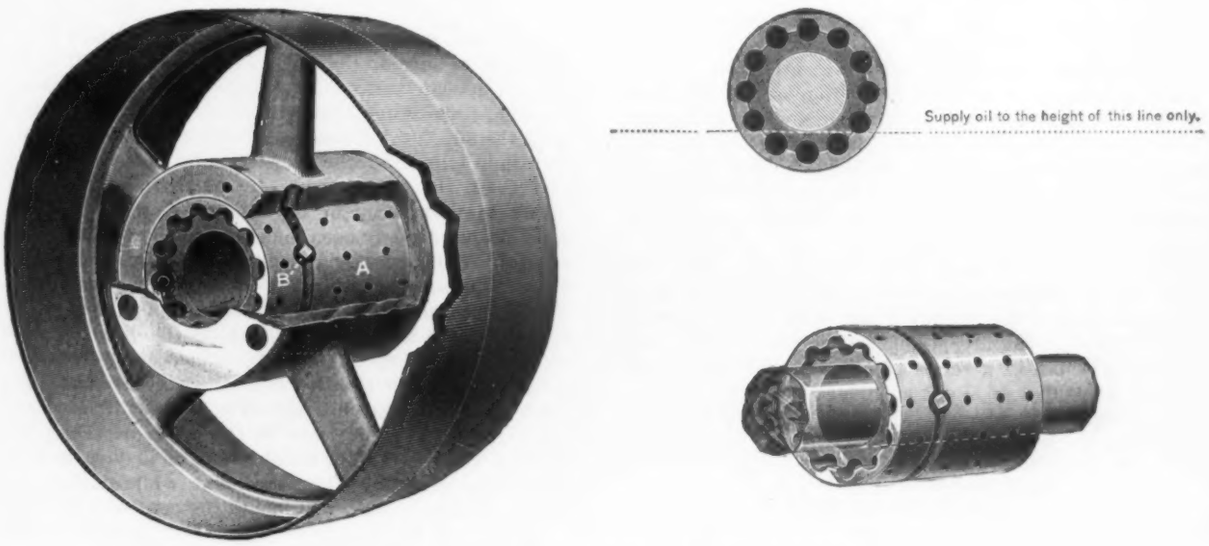
A conference of representatives of the local Sheet Metal Contractors' Association and of the Sheet Metal Workers' Union was held in Chicago on January 16. The main points of contention are the wage scale, the question of helpers and the Saturday half holiday. The union men demand 42½ cents per hour for inside and outside work. The contractors demand either a lower price for all work or that inside work be omitted from the agreement entirely. They claim that within recent years they have been forced to abandon their country trade, which amounted to a great deal, on account of the high wages paid in Chicago, which are higher than in any city except in New York. The whole Western trade has been taken by St. Louis, Milwaukee and St. Paul, and this has been a cause of much grievance to the Chicago men. Heretofore, also, the contractors were permitted to employ only as many helpers as the union

thought fit, which in many cases forced the contractors to employ journeymen and pay 42½ cents an hour, while helpers could have done the work as well at a cost of but 25 cents per hour.

The unionists demand the Saturday half holiday, on both inside and outside work, while the contractors are willing to grant it for the outside work during June, July and August, but want to reserve the right to do as they think fit for inside work. Both parties agree on the eight-hour scale. So far, the contractors have had the best of the controversy, and say that they are not affected by the present attitude of the union. If an agreement is made, and it is thought probable that it will be, the Chicago Sheet Metal Workers' Union will withdraw from the Chicago Building Trades Council.

The Woods Self Oiling Loose Pulley.

The loose pulley here illustrated revolves on the sleeve A, which is fastened to the shaft by the set screw B. Large holes in the sleeve extend from end to end and form capacious oil spaces, from which small radial holes conduct the oil to the bearing surfaces. When the shaft is revolving the oil is carried to the bearings by centrifugal force; when the belt is on the loose pulley and the shaft is at rest the oil flows by gravity to the bearing through the lower rows of holes. No felt, wick or fabric of any kind is used as an oil retainer, and after the pulley is once thoroughly lubricated it does not require reoiling oftener than once a month under ordinary use, and in some instances it has been known to run as long as ten months without being reoiled. This pulley is manufactured by the S. A. Woods Machine Company of South Boston, Mass.



THE WOODS SELF OILING LOOSE PULLEY.

Charcoal Retorts at Gladstone, Mich.

The Cleveland-Cliffs Iron Company, says the Marquette (Mich.) *Journal*, recently erected ten retorts for the charring of wood for their furnace at Gladstone. They will be built instead of the old time kilns in the future and in time will replace them. The new retorts have been in use but a few days. They each take 5 cords of wood which they completely char in two hours, thus having a capacity equaling ten of the old style kilns. The steel shells of the new retorts are externally heated with coal. Thus far at Gladstone screenings have been experimented with, but Manager Austin Farrell hopes to find a source of supply of bituminous coal. He is figuring with some lower Michigan miners and may buy the fuel in this State. The new retorts will be connected with the company's chemical plant, the by-products of wood alcohol and gray acetate of lime being secured. December, 1900, was the banner month in the history of the plant for the production of alcohol, 14,920 gallons being made. There has been a good demand for this product right along, it commanding 75 cents a gallon delivered at Eastern points. At Gladstone about 3½ gallons of alcohol are secured from a cord of wood, a remarkably high average compared with the results obtained in chemical plants run in conjunction with other blast furnaces. In addition about 300 pounds of acetate of lime are obtained from each cord of wood. A cord of wood usually weighs about 5000 pounds. Of this 2500 pounds are pyroligneous acid. Twelve different oils are also contained but none are saved, there appearing to be no market for them.

The Nicaragua Canal.

CORINTO, NICARAGUA.—Reverting to the condition of things here regarding the waterway, it may be stated that the people at large are beginning to understand the great need of building the canal to save the country from financial and general disaster. Meanwhile, many of the higher officials find it convenient to take it for granted that the United States must build the canal and pay for it as well. Acting on this they are taking up all the land available on the shores of the proposed waterway, as private property, to be afterward sold to the United States Government for vast sums, and not a few foreigners are mixed up in this deal. Our Government will have to be on the lookout for schemes which will be sprung at every turn now, for the purpose of bleeding the American people. Eventually, if this goes on as at present, it may still be desirable to make some arrangement with the Panama Canal people, if that route can be bought outright, without being weighed down with outside exactions.

From a busines point of view, not only Nicaragua, but Costa Rica, Honduras, Guatemala and Salvador are to-day totally dependent on the canal for future prosperity, and the very least that Nicaragua and Costa Rica can do is to place things as they were at the time of the Guzman and Carazo Governments, when every facility was given the United States, absolutely free of cost. In truth, had we taken hold then, the canal would have been in running order by this date, to the great advantage of all concerned.

In anticipation of a large and sudden increase in population here, American iron goods have taken a stride forward in price and many new orders are being placed. Plows, reapers, harrows, wire and corrugated iron from American factories are coming into daily use throughout the country. The only thing that can stop the increase of business on these lines is arbitrary import duties on the part of the Government here. C.

The Ship Subsidy Bill.

WASHINGTON, D. C., January 22, 1901.—Very substantial progress has been made during the past week by the friends of the Ship Subsidy bill in the Senate, and, as a result, the entire Republican membership has been brought into line, not only to vote for the measure after it has been adequately discussed, but to aid in keeping it before the Senate to the exclusion of all other measures except the annual appropriation bills and the war revenue reduction bill. Thus the contest has been narrowed down to a struggle between the majority and the minority, the former endeavoring to bring the bill to a vote, and the latter by tactics of every variety seeking to postpone a ballot until Congress expires on March 4.

As has been stated in these dispatches, the Republican Senators have not heretofore been a unit either in advocating the general proposition of a ship subsidy or in favoring the measure as reported from the Senate Committee on Commerce. Those who were indifferent as to the passage of any bill were not hostile to the subsidy plan, however, but had not been convinced that their immediate constituencies would secure any advantage from it. Those favoring a subsidy but unwilling to accept the Commerce Committee's bill had plans of their own which they believed would greatly strengthen the measure. Both these contingents have been brought into line during the past week through the energetic efforts of Senators Frye and Hanna. It has been demonstrated to the satisfaction of the Senators of the first class that the interior States will reap a great benefit through the decreased freight rates on agricultural products which it is claimed the subsidy law will bring about, and, especially, that there is no danger of a combination being effected strong enough to increase freight rates between United States ports and those in which American produce finds its principal markets. The task of winning over the second class referred to has been more difficult, but it has finally been accomplished through the acceptance on the part of the managers of the bill of a series of amendments drafted by Senator McMillan of Michigan, which are said to represent not only his personal views, but those of Senators Allison, Aldrich, Burrows, Spooner, Nelson, and others.

The Amendments.

The McMillan amendments as submitted to the Commerce Committee were not wholly acceptable, but their author and his colleagues sharing his views were willing to modify them somewhat. After mutual concessions had been made Senator Frye gave out the following statement describing definitely the changes decided upon:

"No extra compensation to be allowed vessels of over 18 knots, thus cutting off about $50,000 from each of the fast going mail ships, as provided under the original terms of the bill.

"No compensation to be allowed oil tank vessels.

"The length of time for which contracts can be made is reduced from 20 to 15 years.

"The number of foreign vessels to be admitted to American registry, provided a like tonnage is built in the United States, is limited to four vessels to each firm for each class—that is, four vessels already built and four vessels for which contracts have been made and not completed. The effect of this bill will be to reduce the amount of foreign tonnage that may be admitted to American registry under the terms of the bill from about 350,000 tons to 200,000.

"A modification of Clause 'F' of the bill makes it necessary for any ship owner or builder to actually begin the work of construction before a contract will be entered into."

In addition to the above modifications Senator McMillan and his colleagues had proposed that a large portion of the compensation provided by the bill should be paid in the form of postal subsidies, but while conceding the theoretical soundness of this proposition Senator Frye made the point that a Postmaster-General unfriendly to a subsidy policy might at any time nullify the law; and, further, that it would be difficult to avoid scandals in connection with alleged favoritism that might be shown to certain lines. Senator McMillan was disposed to accept this view and withdrew the amendment. The committee was reluctant to accept the modification refusing compensation to oil tank vessels for the reason that in the opinion of the managers of the bill the tank vessel though owned by the same interest that supplies all of its cargoes is a very potent factor in reducing and keeping down freight rates. Economical transportation in such vessels, it is maintained, is a matter of vital importance to crude oil producers throughout the country. A similar amendment had already been adopted by the House Committee, however, and the managers of the bill in the Senate felt constrained reluctantly to accept the modification. The amendment reducing the contract period from 20 to 15 years was not regarded as a vital point, for the reason that the managers of the bill have from the outset anticipated a reduction, and fixed the period in the original bill at 20 years in expectation of cutting it to 15 years before the passage of the measure. The reduction in the amount of foreign tonnage that may be admitted to American registry from about 350,000 to 200,000 is a concession to the American shipyards, and is intended to meet the objections of several high protection Senators who have regarded this feature as the weakest point in the measure.

The diverse views of all the Republican Senators having thus been harmonized the managers of the bill now have two delicate tasks before them; first, to arrange a continuing programme that will admit of the consideration of the subsidy bill contemporaneously with the appropriation bills and the war revenue reduction bill; and, second, the silencing of the minority so that the measure may be brought to a vote. A tentative arrangement has already been made to provide for the consideration of the subsidy bill during the present week. Senator Allison, the manager of the appropriation bills, will permit a part of each day's session to be devoted to the discussion of the subsidy bill unless the minority exhibit a disposition to filibuster by unnecessarily debating the pending appropriation bill. In that case the Senate Steering Committee has agreed to hold night sessions which will be devoted either to the appropriation bill before the Senate or to the subsidy bill, as may seem desirable at the moment. This agreement, while subject to change from day to day, will insure the consideration of the subsidy bill, but it will not necessarily bring it to a vote.

For the purpose of ascertaining the strength and probable tactics of the opponents of the subsidy bill the friends of the measure are conducting a careful canvass. Senator Jones, the Democratic leader, declares that while he will oppose the bill and will probably make a speech against it, he will not indulge in filibustering, and he does not think his Democratic colleagues will attempt to defeat the bill by factious opposition. The friends of the bill believe that there are three or four Democratic Senators for whom Senator Jones does not speak when he asserts that no filibustering tactics will be attempted. The Populist Senators, including Allen, Butler, Harris, Heitfeldt and Towne, are all opposed to the bill, and will follow the lead of Senator Pettigrew, who, though elected as a Silverite, has recently dictated the Populist policy in the Senate.

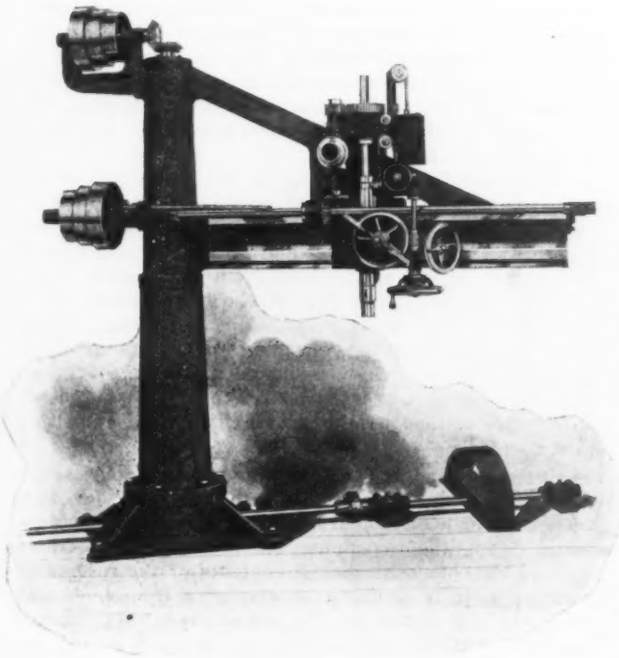
It is now the best opinion that the subsidy bill will pass the Senate unless its opponents engage in a regularly organized filibuster, for it would be extremely difficult, in view of the determination of the Senate leaders to hold night sessions, to stave off a vote by ordinary parliamentary tactics. It should be said, however, that the indications now point to a compact organization against the bill of eight or ten Democrats and Populists who will stop at nothing to prevent its passage.

W. L. C.

United States Consul Ingersoll, at Cartagena, Colombia, reports to the State Department that the Governor of the Department of Bolivar has issued a decree declaring closed to commerce all the ports of the Gulf of Morrosquillo, particularly Tolu and Coveñas.

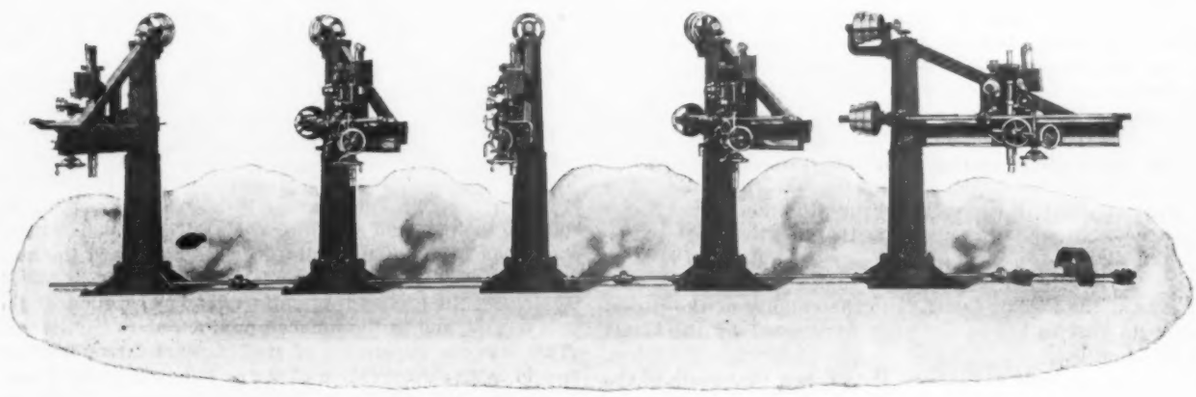
The Prentice Radial Drilling Machine.

The Prentice Bros. Company of Worcester, Mass., recently built for a customer in France ten radial drills of new design, which were set up in gangs of five each. The first engraving shows the main characteristics of the drill, while the other illustrates the various positions



THE PRENTICE RADIAL DRILLING MACHINE.

in which it can be operated. The method of driving them is similar to that employed in driving multiple drills, although in this instance the driving is along the floor. These machines are to be used principally for structural iron purposes, the work going under the machine either on horses, or upon trucks, and perhaps on the floor itself.



THE PRENTICE RADIAL DRILLING MACHINES ARRANGED IN A GANG.

The arm has no vertical adjustment, but may be moved entirely around the column and clamped in any desired position. It is gear driven from the upper horizontal shaft. Three changes of speed and three of feed are provided. The feed is by hand or by power. It will drill holes up to 1½ inches to the center of a circle of 128 inches. The head has adjustment on the arm by hand wheel, rack and spiral pinion, and cannot vary its position by accident or jar. The spindle is counterbalanced and has quick return motion. Each machine weighs 3540 pounds.

The Sharon Mfg. Company.—One of the new industries which have located in Sharon, Pa., within the last few months is the Sharon Mfg. Company, manufacturers of brass castings for hot and cold mills, tuyeres, plates and coolers for blast furnaces, housing screw nuts, and all kinds of heavy brass goods; also babbitt metal of every grade. The works are located in Sharon proper, are equipped with four fast melting furnaces, each having a capacity of 1800 pounds of brass or babbitt per day, or can pour a brass casting to weigh 2400 pounds at one cast. They have just installed a 5-ton overhead power crane, traveling the whole length of the foundry. They are running steadily.

The Sydney Harbor Bridge.

In the absence of sufficient technical ability to adjudicate upon the designs already sent in the New South Wales Government intends to forward the plans to some of the eminent engineers of England and America, and so obtain an able report and recommendation. Meanwhile it is stated that a cable has been sent to the Union Bridge Company of the United States, whose tender was the lowest sent in, suggesting certain alterations in design and asking their cost.

This company offered to build a bridge on the plan suggested by the Public Works Department of New South Wales for something like £1,000,000.

The Union Bridge Company sent two tenders, one for a cantilever bridge to cost $3,100,000, and one for a suspension bridge at $3,046,200. The former was for a bridge consisting of two large cantilevers 70 feet apart, with a shore arm 576 feet long resting on an oscillating bent, and supporting one end of a span of 132 feet, the other end resting on a pier on shore. The harbor arm of each cantilever is 384 feet long and the central span is 512 feet. The second design was for a suspension bridge of 1330 feet span, on steel towers 360 feet above high water. The bridges in either case to be constructed of high carbon steel.

The prize of £1000 for best design was awarded to a Mr. Cruttwell of Westminster, London, tendering through Sir William Carroll & Co., Limited, Glasgow; amount of tender, £2,927,236.

The £500 prize for the second best design went to Norman Selfe of Sydney, tendering through a German firm at the cost of £1,875,000. Numerous other tenders were received, the only other ones from America being those of E. S. Shaw, 12 Pearl street, Boston, Mass., $7,380,000 for a cantilever bridge, and E. K. Morse, Pittsburgh, Pa., for a suspension bridge at £1,102,942.

An amendment in the charter of the Richmond Locomotive & Machine Works of Richmond, Va., has been authorized whereby the capital stock of the concern is increased from $2,500,000 to $4,500,000.

The Inspection Department of the Associated Factory Mutual Fire Insurance Companies, at Boston, has issued in pamphlet form specifications of Underwriter Fire Hose, Play Pipes and Hose Houses.

The Jones Mixer Patent.

WASHINGTON, D. C., January 22, 1901.—The Supreme Court has set for argument during the present week the case of the Carnegie Steel Company, Limited, *vs.* the Cambria Iron Company, involving the validity of what is claimed to be one of the most important patents now used in the so-called continuous process of making steel direct from the blast furnace. The suit against the Cambria Iron Company was instituted by the Carnegie Steel Company on a charge of infringement of the so-called Jones patent, owned by the petitioners. This process is now said to be employed in all the principal steel works of the United States and in many of the steel works in Europe, where its importance has received practical recognition by the payment of royalty to the owners of the European patents. The case was originally brought in the United States Circuit Court, where the defendants in their answer averred anticipation of the patent, which was dated June 4, 1889, and further denied infringement thereof. The court found that the process was patentable, had not been anticipated by prior references to the same end; that it was "of vast utility and importance," and that the defendants used the process and therefore infringed. A decree having been entered for an injunction and an account, in accordance with this opinion, the case went to the Circuit Court of Appeals on appeal of the defendant, and that court reversed the decision of the court below, remanding the case, with directions to dismiss the bill on the ground that the defendant's device did not infringe the patent. The Carnegie Steel Company thereupon filed in the United States Supreme Court a petition for a writ of certiorari, which was granted, and the case comes up in obedience to that writ, the petitioner claiming that the Court of Appeals erred in several important details of its ruling. In describing the scope of the Jones invention, upon which the case is based, the petitioners in their brief, just filed in the case, say:

"William R. Jones, manager of the Edgar Thomson Steel Works of the Carnegie Steel Company, invented a process of mixing molten metal for use in steel works, which enabled him to secure uniformity of product, while at the same time dispensing with a tedious and expensive treatment intervening, under the old practice, between the reduction of the ore in the blast furnace and its conversion into steel at the converters.

"The importance of this invention to the art cannot be overstated. Indeed, its great and world wide value, and the gravity of the rights of the inventor and the defendant, are stated by the Circuit Court as an apology for the exhaustive and scholarly opinion wherein may be found a lucid exposition of the principles upon which the patent rests and their application to steel production.

"The Commissioner of Patents in his report for the year of its birth specifically calls attention to the Jones process patent as one marking the growth of the industrial arts.

"It should be here marked that not one of the findings of the Circuit Court as to the validity of the patent or its vast utility is seriously questioned by the Court of Appeals.

"The process of Jones is the process that realized the oft expressed hopes of Sir Henry Bessemer and other great manufacturers—that at some time it would be possible to make steel directly from molten metal taken from blast furnaces, without the expense and delay incident to the intermediate cupola process, the only successful method of making Bessemer steel until the Jones method was perfected.

"To understand this and its application to the case it is well to call attention to the history of the art, concerning which no question has been or can be raised.

"Prior to Bessemer's discovery of the great principle that iron contains within itself the ingredients for its own purification, and that it can be purified and refined without the use of fuel by blowing a blast of air through a molten mass, thereby consuming the silicon and carbon and other nonmetallic constituents, and thus fitting it for immediate conversion into steel by recarbonization, there had been no such thing known as the production of steel for the grosser uses, such as rails, bridges and structural purposes. Such steel as was produced, for cutlery and use in the finer arts, was the product of puddling furnaces and crucibles, and, as will be seen, the invention of Bessemer was the first great step in the art of steel making, as it is now known to the world.

"In this Bessemer process of purification the carbon is destroyed, and, after the destruction of the carbon and other nonmetallic constituents, the mass becomes pure iron, which is recarbonized to make steel. The inventor of the present method of recarbonization was Mr. Mushet, who accomplished it by the introduction of spiegeleisen while the iron in a molten state was being poured out of the converter in which it was purified, thus converting it into steel. This was the second great step in the art of making steel.

"The third and final step in the perfection of the Bessemer process is the one with which we are now dealing. The discovery was a process making practical Bessemer's theory that steel should be made directly from the molten metal, as it comes from the blast furnace, without having to pass through the intermediate or cupola process, which involved casting the furnace metal into pigs, which, after becoming cool, were assorted, broken up, recharged and remelted in a cupola furnace, and then placed in a converter for conversion into steel. The Jones method eliminated altogether this remelting in a cupola."

In describing the Jones invention, it is stated that it consisted in "introducing into a mixing receptacle successive portions of molten metal ununiform in their nonmetallic constituents (sulphur, silicon), removing portions only of the composite molten contents of the receptacle without entirely draining or emptying the same, and successively replenishing the receptacle with fresh ununiform additions. . . . When the metal is poured out of the spout a considerable quantity may also be left remaining and unpoured, and whenever a vessel is replenished there may already be contained in it a body of molten metal with which the fresh addition may mix. . . . The tilting of the vessel does not drain off all the contents thereof, a portion being prevented from escaping by reason of the elevated position of the spout, and as the vessel is replenished from time to time each new charge mixes with parts of the previous charges remaining in the vessel. . . . I thus secure as much as possible uniformity in character of the metal which is conveyed to and discharged from the tank and causes the fluctuations in quality of the successive tappings to be very gradual. Thus, any sudden variation in the quality of the metal supplied to the converter is avoided.

"Bessemer contemplated the direct process for the conversion of iron taken directly from the blast furnace," continues the brief, "and believed that it was a valuable part of his invention. The experience of manufacturers, however, demonstrated the impossibility of successfully refining iron without casting it into pigs, selecting or mixing the pigs and remelting them. This was necessary because of the ununiformity and irregularity in the nonmetallic constituents of the molten blast furnace metal, which resulted in such ununiformity in operation of the converters, and in the finished product, as to bar its use. This was the experience of steel makers throughout the world, with the exception of one or two in Europe, where, owing to the peculiarly uniform character of the ore used, the direct process was carried on with measurable success, but in the United States it was never undertaken without being abandoned, except by the Carnegie Steel Company, who, in the hope of realizing its tremendous economic advantages, struggled along with various modifications of method, until the discovery of Captain Jones made it the perfect success it is to-day."

It is further claimed that Captain Jones instituted between the blast furnace and the converters an apparatus for carrying on the new process—a vessel designed for the sole purpose of receiving and mixing the charges of molten metal and holding a large pool of the same; he provided one set of ladles for removing the converter charges as required and taking them to the converters, and another set of ladles for carrying the molten pig metal from the blast furnace in small lots, replenishing the mixer from time to time and thus maintaining it substantially full of molten metal. The two sets of

ladles and the intermediate mixing vessel introduced by Jones, it is contended, constituted a practical novelty, and a new name, "mixer," was introduced into the vocabulary of the art, and this apparatus is now claimed to be as well known and its value as highly appreciated as that of any other part of the machinery of a steel plant.

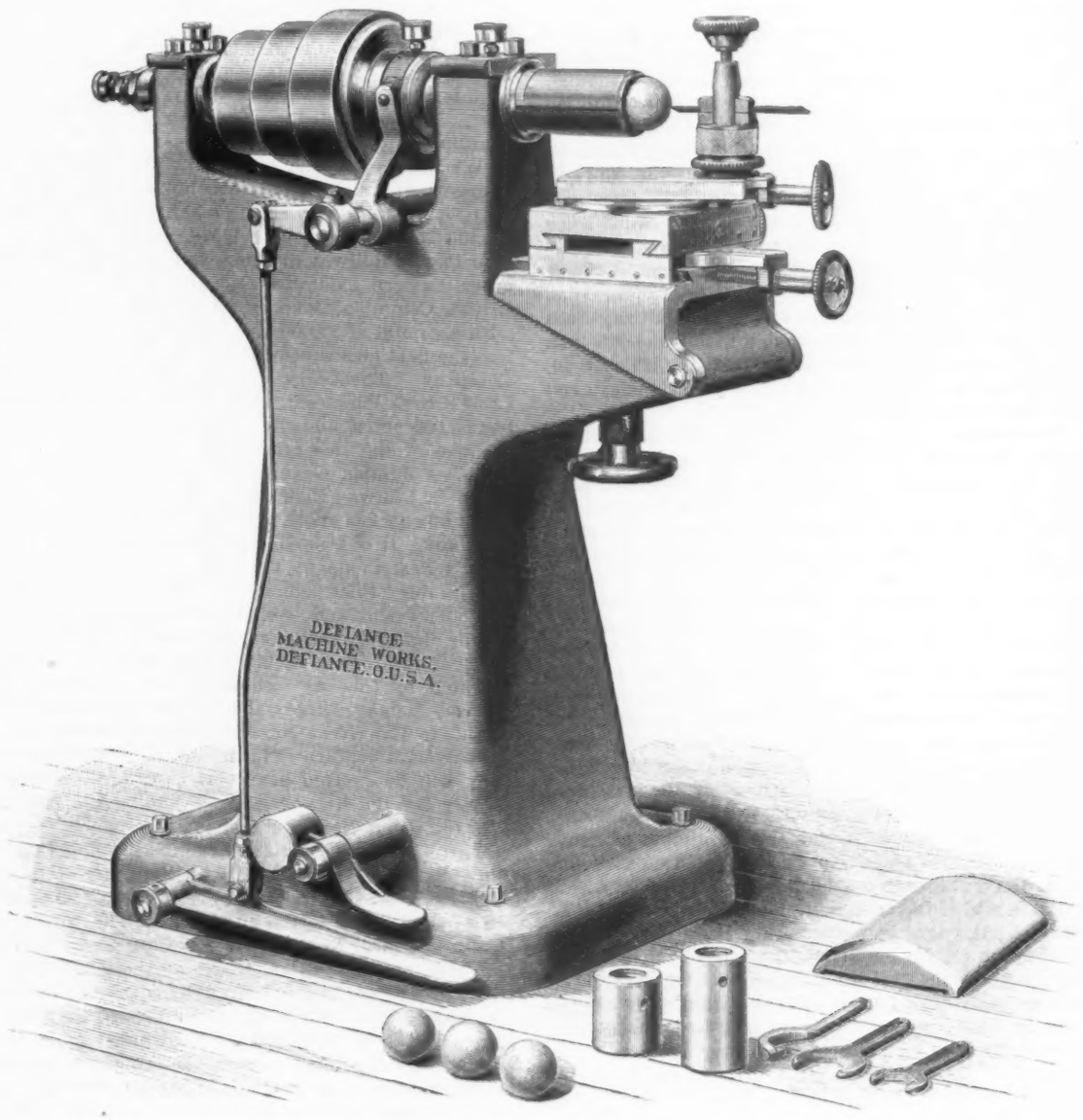
The defendants in this case maintain that the so-called Jones process was not patentable, and further, that its employment by the Carnegie Steel Company had been anticipated by other steel makers. Especially it is argued that it was a common practice of operating cupola furnaces in the manufacture of foundry castings to mix the molten metal, which practically anticipated the so-called Jones patent. It is further urged that the patent was anticipated by a practice common in steel works prior to Jones' invention of tapping iron from the cupola furnace into the receiving ladle, from which it was poured into the converters. Such a ladle was used by the Pennsylvania Steel Company, the Cambria Iron Company and the Lackawanna Iron & Steel Company.

Eminent counsel have been employed to argue this case, and in view of the broad claims made by the petitioners and the general use of the process alleged to be covered by their patents the decision of the Supreme Court will be watched with much interest. W. L. C.

Information Wanted.—A correspondent interested in the utilization of oil for melting pig iron desires to obtain records of past experiments and details as to that type of furnace, and style of burner.

The Defiance Ball Turning Lathe.

The ball turning lathe built by the Defiance Machine Works of Defiance, Ohio, is intended for turning and finishing balls from ivory, wood or other material. The head spindle is fitted into long bronze self lubricating bearings arranged to take up for wear. It is driven by a three-step cone pulley fitted with bronze bearings. The pulley engages with a friction disk feathered to the spindle and having a slight horizontal movement on the shaft. A treadle with the necessary connections is used for engaging the frictions. A slight pressure of the operator's foot upon the lower pedal immediately starts the friction, which continues to run until the foot of the operator is applied to the upper pedal, when the frictions are immediately disengaged and an automatic brake is applied, instantly stopping the machine. By this arrangement the operator has complete control over the machine from the working side. The compound tool rest is provided with every desired adjustment horizontally with the spindle for regulating the diameter of turning; also a right angular adjustment to center the tool with the work and a rotary swinging movement to secure the circle of the turning. The tool post has a vertical adjustment to bring the cutting edge of the tool central with the work. The tool post is hinged to the frame and can be swung down out of the way when using the machine for polishing. The shield shown on the floor is then placed over the finished surface of the table to protect it.



THE DEFIANCE BALL TURNING LATHE.

Canadian News.

To Ship Atikokan Ore.

TORONTO, January 18, 1901.—It looks as if the Ontario & Rainy River Railway would not have a monopoly of the business of carrying ore from the Atikokan mine, should that New Ontario property prove as productive as it is expected to be. The Canadian Pacific Railway Company is reported to be taking an interest in the prospective traffic. The Atikokan mine is but 32 miles south of the Canadian Pacific Railway track. Should the mine turn out to be a good shipper it would seem probable that the Canadian Pacific Railroad would run a line into it and carry the ore to Fort William. This would be likely to affect the business of the Ontario & Rainy River road, which is now approaching the Atikokan. It would also affect Port Arthur, which had hoped to be the center of the iron ore trade at the Canadian head of the lakes. Port Arthur nursed this ambition the more because of the way it was treated by the Canadian Pacific Railway. A dispute between the town and the road at the time the Canadian Pacific Railway was being built led to the road bringing its terminals to the twin town of Fort William. It will cause some chagrin in Port Arthur if its inseparable rival, Fort William, should now participate in the ore trade.

According to the Fort William *Times-Journal*, Wm. Whyte, manager of the Canadian Pacific Railway lines west of Fort William, visited that town on the 9th inst. and was met there and conferred with Captain Sellwood, representing the American Steel & Wire Company, and R. M. Hunter of Duluth.

A prominent official of the Ontario & Rainy River Railway Company was interviewed as to the probable effect the building of ore docks by the American Steel & Wire Company at Fort William would have on the plans of the Ontario & Rainy River Railway Company. The official in question said if the Atikokan mine contained the quantity and quality of ore calculated on, his company would assuredly build ore docks at Port Arthur. He said that the steel is already laid to the Atikokan range and that supplies for the miners are being forwarded over the road. As soon as the results of the diamond drill tests are made known his company will set to work to secure their share of the ore traffic.

Notice has been given that application will be made at the session of Parliament that opens next month for an act confirming the amalgamations of the Canadian Northern Railway Company with the Ontario & Rainy River Railway Company and the Manitoba & South Eastern Railway Company. The whole stretch of line thus united will form a long section of a transcontinental system in which the Ontario & Rainy River line will be a link. That name now disappears from use, and the road through the Rainy River district goes by the name that comprehends the whole—that is, "The Canada Northern Railway." It is expected that part of the Manitoba wheat grown this year will be shipped from Winnipeg by the Canadian Northern next autumn.

Last year a tunnel was driven through the McKellar locations on the Atikokan, and a body of ore aggregating 150 feet in width was revealed. The body is made up of several small veins and a large one, 60 feet wide.

Railway Competition in Crow's Nest Coal.

Rather a mixed situation is developing in the mineral districts of Southern British Columbia. It concerns the railway traffic of that part of the province, the trade between that district and the East, the marketing of Crow's Nest coal and the smelting of the ores in the Slocan and Trail Creek region. The indication of a change in the present status is a notice published in the *Official Gazette* of Canada that an act will be applied for at the next session of Parliament to incorporate a company to construct a railway from the coal mines at Michel, in the East Kootenay District, B. C., thence by way of Michel Creek southward to the international boundary; also from Michel Creek northerly along the Elk River to the main line of the Canadian Pacific Railway; also from a point on the proposed line northeasterly by the North Kootenay Pass to connect with the Crow's Nest Pass Railway. Briefly, this means that the Great Northern Railway proposes extending a line into the Crow's Nest coal fields. This notice of application was made some days after certain Toronto men, who are directors of the Crow's Nest Coal Company, visited St. Paul and had an interview with J. J. Hill, president of the Great Northern. It was reported that Mr. Hill bought a large interest in the company's mines as a result of the meeting. When the Toronto men came home they said he only contracted to take a proportion of the output of the mines—800 tons of coal per day. Of course, this could not well be taken without railway communication. The Canadian Pacific Railway certainly could deliver the coal to the Great Northern, but there appears to be variance between the Canadian Pacific Railway and the coal company.

Robert Jaffray, the vice-president of the Crow's Nest Coal Company, gave his company's side of the case in an interview published a few days ago in the Montreal *Star*. He accused the Canadian Pacific Railway of charging extortionate freight rates.

What goes furthest to explain the trouble is an announcement, made in these columns some weeks ago, that Sir William Van Horne (chairman of the Canadian Pacific Railway board) and Mr. Angus (another Canadian Pacific Railway director) had, together with several other Eastern capitalists, secured a charter from the British Columbia Government to form a coal company with a capital of $4,000,000. The entry of this company into the field means competition for the Crow's Nest Pass Company. This company have 250,000 acres in the Crow's Nest Pass coal belt; the Dominion Government has 50,000 acres, and the Canadian Pacific Railway has the rest of the rich land grant that was given by the British Columbia Government to the British Columbia Southern Railway Company. That is, the Canadian Pacific Railway has about 3,000,000 acres, much of which is coal land. It is leased by a private agreement with the Crow's Nest Company not to go into coal production so long as the former sufficiently supplies the market. But an independent coal company, consisting of Canadian Pacific Railway capitalists, presumably may go into the business, and that seems to be what is happening. Irritated by this, as well as by the Canadian Pacific Railway freight charges, the Crow's Nest Company have turned to the Great Northern Railway Company. All the powerful political influence of the Crow's Nest Company will be exerted next session to push through the charter for the line of railway joining the coal mines with the Great Northern system.

There is to be a meeting of the Crow's Nest Coal Company shareholders in this city on February 4 to confirm a by-law increasing the capital from $2,000,000 to $3,500,000 by the issue of 60,000 additional $25 shares. Twenty thousand shares of this new issue are to be allotted to J. J. Hill, president of the Great Northern Railway Company, at $40 per share. Mr. Hill is said to be already the possessor of 10,000 shares purchased at $62.50 per share, the stock having been contributed by a number of holders and sold in a lump. It is understood that in return for the stock at these prices Mr. Hill has undertaken to make certain concessions in connection with the spur line. It is further said that he guarantees to take all surplus coal from the company up to 6000 tons per day.

Evidently the War Eagle Company, whose head office is in Toronto, and who operate upon the largest scale in the Rossland camp, do not believe the Canadian Pacific Railway's rates are exorbitant. The War Eagle Company have just bought, at least provisionally, the Canadian Pacific Railway smelter at Trail. Possibly they have also entered into an agreement to take coal from the new Van Horne-Angus Coal Company.

The Montreal *Herald* is a supporter of the Government and the Toronto *Globe* is the leading Government organ. The latter accuses the Canadian Pacific Railway of charging excessive freight rates, and the former defends that corporation, maintaining that it is the Crow's Nest Coal Company who are guilty of discrimination, furnishing coal to United States customers for $1 to $1.25 less than to Canadian customers.

Halifax Wants the Yards.

Halifax is prepared to negotiate with the capitalists who, acting apparently on an understanding with the Dominion Iron & Steel Company, propose to form a company to establish and operate great yards for building steel vessels at Halifax and St. John. On the 8th inst. there was a special meeting of the Halifax City Council to deal with the subject, and a crowd of influential citizens were present. A letter was read from C. Ochiltree Macdonald, of the Gowrie and Blockhouse mines. In it Mr. Macdonald, who knows much about the steel shipbuilding industry in the United Kingdom, said Halifax was a promising center for the industry, its distance of 300 miles from Sydney, the source of the material, not being a greater disadvantage than is to the Belfast shipyards the distance they have to bring their material. After some discussion a resolution was passed authorizing the appointment of a committee of six to act with six members of the Board of Trade to investigate the matter and report back to the council. A committee was appointed. A similar committee was appointed by the Halifax Board of Trade. The two committees held a joint meeting on the 14th inst. By the Board of Trade committee the idea was favored that the city's aid to the enterprise should be in the form of a bounty of $2 per ton on every steamer built and put afloat, this arrangement to hold for five years. For a further period of five years the Board of Trade committee would give $1 per ton. The City Council committee proposed another arrangement, which was as follows: A city subsidy of $6000 a year if the proposed shipyards were constructed, and an additional subsidy of $4000 a year if the establishment should include boiler and engine works, this for a period of 20 years. The promoters say that the steel shipbuilding works they are to erect at Halifax will be as large as any in the world. Subsidies are expected from both the Dominion and the Provincial Government, as well as from the city of Halifax.

Lighting and Power Company of Montreal.

In Montreal a company are being organized under the name of the Lighting & Power Company of Montreal, with a capital of $25,000,000, to take over all lighting and power companies in the city, including the Chambly Mfg. Company, the Royal Electric Company (not their manufacturing department, which has been absorbed by the Canadian General Electric Company), the Montreal Gas Company, and the Lachine Rapids Hydraulic & Land Company. This undertaking is popularly associated with another project mentioned lately in these columns, namely, the manufacture of coke in Montreal, an undertaking credited to H. M. Whitney. Thus to Mr. Whitney's organizing mind is attributed the big union of light companies in Montreal. He has already brought into existence the New England Gas & Coke Company, at Everett, Mass., and the People's Heat & Light Company at Halifax.

Minor Notes.

Notice is given in the *Official Gazette* of the Dominion that at the next session of Parliament application will be made for an act to incorporate the Clergue Iron & Nickel Steel Company of Canada. It is added in the application that the operations of the company will be carried on at or near Sault Ste. Marie, or at or near the city of Quebec.

The manufacturers of locks sent a deputation to wait on the Minister of Customs to complain of undervaluation for duty of locks imported from the United States.

Negotiations are proceeding to bring to Collingwood a large concern to manufacture wire. An American syndicate, said to be represented by the Stanyon-Miller Engineering Company of Pittsburgh, have made some proposals to the Cramp Ontario Steel Company for the purchase of a proportion of the latter's output to be made into wire, nails, &c., for export.

A cargo of 5185 tons of Ohio coal was laid down at St. John, N. B., on the 16th—the first coal ever known to be imported at that city. It is part of an order of 100,000 tons that the Dominion Government placed for the use of the Intercolonial Railway. This coal was ordered as a precaution against the effects of a coal strike in Nova Scotia. The latter, however, was settled almost immediately.

The by-law to amend the agreement between the city of Kingston and the company that are to build the iron furnace there received the sanction of the rate payers, and it is expected the works will be proceeded with.

Manufacturers of sewer pipe have protested to the Dominion Government that pipe is admitted from the United States at undervaluations.

The Ossekeag Stamping Company, manufacturers of granite ware and tinware, Hampton, N. B., have decided to go into liquidation. They employed 75 to 100 men.

Dr. Selwyn, former head of the Dominion Geological Survey, condemns the shipping of British Columbia ore to Chili for treatment.

T. H. Davies & Co., owners of iron works in Honolulu and Liverpool, have, it is reported, purchased the iron works of Armstrong & Morrison, Vancouver, B. C. New plant is to be put in at a cost of $150,000.

Persons connected with a large locomotive company in the United States are making inquiries with a view to erecting locomotive works in Nova Scotia. C. A. C. J.

Turbines for Niagara.

The Niagara Falls Power Company have awarded a contract for six new 5000 horse-power turbines to the I. P. Morris Company of Philadelphia, Pa. These new turbines will be somewhat different from the present turbines, and will be built after designs prepared by Escher, Wyss & Co. of Zurich, Switzerland. It will be recalled that the turbines now in use were built after plans prepared by Picard Pictet & Co. of Geneva, Switzerland. Dr. Coleman Sellers, chief engineer of the Niagara Falls Power Company, and William A. Brackenridge, resident engineer of the same company, visited Geneva, Switzerland, some months ago in regard to the new turbines and their design. Upon their return last spring the Niagara Falls Power Company invited competitive plans from Escher, Wyss & Co. of Zurich, Switzerland, and these plans have now been accepted.

There are two wheels in the present turbine, but it is understood that the new turbines willl have but a single wheel. Other features in which they will differ will be principally that the guides and buckets are inclosed in the wheel case and have draft tubes, which will allow the utilization of the full head available.

The contract for the new turbines provides that they shall be delivered about August next. They will be used to drive the six 5000 horse-power generators, contract for which was awarded to the General Electric Company in November last. The consulting hydraulic engineer of the Niagara Falls Power Company is Clemens Herschel.

The new wheel pit has reached a depth approaching 120 feet. Work is being carried on night and day. While the full plans for the new power house have not yet been announced and while its general design will be similar to the present station, it is known that there will be numerous new features in the interior arrangement.

Steel Rails for Victorian Railways.—American Tender Successful.—Six tenders, from American, English and German concerns were recently received by the Victorian Railway Department for the supply of 14,200 tons of 80-pound steel rails, 3240 tons of 100-pound steel rails and 1880 tons of fish plates (about two years' supply under existing conditions). Tenders closed December 10, and the lowest, which were accepted, came through Jas. McEwan & Co., limited, on behalf of the Illinois Steel Company of Chicago, and the Lorain Steel Company of Cleveland, U. S. A. Five pounds 17 shillings and 9 pence per ton for the rails, and £7 7s. 6d. per ton for the fish plates was the accepted price, for delivery in trucks at Melbourne. The Department certainly expected to pay more than the above, reckoning to pay about £150,000 for the whole contract, instead of about £117,000. Two years ago a similar contract was let at £4 18s. 6d. for rails and £7 18s. 3d. for fish plates. The Victorian Government recently had under offer a proposal from an English company to establish works in Victoria if the Railway Department would guarantee to take 10,000 tons of rails per year for ten years. The matter was dropped, as Victoria's resources in iron ore, though they may be vast, are not yet proven.

Railroad Gross Earnings in 1900.

The *Commercial and Financial Chronicle* presents its annual report of gross railroad earnings, covering 181 roads, whose mileage was 163,214 miles out of a total of about 196,000 miles. The figures show earnings of $1,297,889,724, as compared with $1,198,289,908 during the preceding year. Our contemporary says:

We should judge that for the whole United States the gain in 1900 must have been not less than $125,000,000. On a previous occasion we estimated the increase for 1899 at $140,000,000, for 1898 at $90,000,000 and for 1897 at $75,000,000. In other words, in the four years there has been an improvement of $430,000,000 in the gross earnings of our railroads. By this we do not mean that the increase for the four years when added together amounts to that sum, but that earnings have actually risen in that figure, the gross revenues for 1900 exceeding the gross revenues for 1896 by $430,000,000. What a wonderful difference in conditions this addition of over $400,000,000 to the gross revenues of our railway transportation lines represents. In view of it, and the harmonizing tendency which has developed in the railroad world, is the great rise in the market value of the securities of these properties which has recently occurred difficult to account for? And with the railroads spending $400,000,000 more per annum than they did in 1896 (for every dollar received is, of course, paid out again in one form or another), quickening every avenue of trade, is it any wonder that the tide of business prosperity still keeps rising?

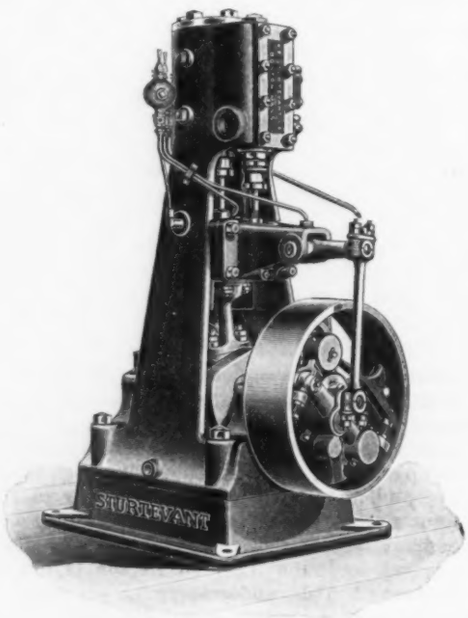
We have referred to the great gain in earnings as an indication of business prosperity. What has been said proves that the improvement in earnings has been itself the principal factor in this prosperity. In any review of the revenues for the year it deserves to be stated that, contrary to the experience of some of the earlier years of this period, the crop movements have not been contributory sources of the gain in earnings. In other words, the increase in tonnage has been in merchandise and general freight rather than in that of the leading staples. One supplementary aid, however, the roads have had—namely, better rates. In the main these better rates have followed from a closer adherence to schedule tariffs. Cuts in rates were occasionally reported, but the trouble occurred only in isolated instances, and was never prolonged. In part the better rates also followed from an actually higher charge for the service. In some instances these higher charges arose from changes in classifications, articles being transferred from a lower to a higher class. In other instances there was a direct advance in rates.

South Beloit, Wis.—The citizens of Beloit, Wis., are elated over the prospects of securing the same footing as Chicago in the matter of freight rates. It is the intention to locate a manufacturing addition to Beloit, to be known as South Beloit. Land has been purchased by a syndicate, and arrangements are already being made for the removal of some of the largest manufacturing establishments in Beloit to South Beloit. It is stated that the J. Thompson & Sons Mfg. Company, manufacturers of agricultural implements and gas engines, will remove to the new location as soon as buildings can be erected. They will double the output of their plant. The present buildings of the Thompson Company will be occupied by another manufacturing enterprise. It is stated that arrangements are being made for the location of new enterprises from outside points at South Beloit. It is expected that the Burlington & Illinois Central railroads will build extensions from their present lines to Beloit within the coming year.

Shorter Hours for Machinists.—President James O'Connell of the Machinists' International Union is stated to be traveling throughout the country making arrangements for continuing the fight this spring in favor of shorter hours for machinists. A large number of machine manufacturers are not members of the National Metal Trades Association, and are therefore not operating their shops in accordance with the agreement made last year by that association and the union. It is the intention of the union to endeavor to bring the outside shops in line and lessen the work day from ten hours to nine hours. Mr. O'Connell is reported to have stated that in his opinion a strike in the many plants not included in the National Metal Trades Association could not be avoided in the spring.

The Sturtevant Small Vertical Engine.

The accompanying illustrations present a type of small vertical engine adapted to general use, which has recently been brought out by the B. F. Sturtevant Company of Boston, Mass. It is built in three sizes, ranging from 2 to 4 horse-power, with speeds of 1000 revolutions for the smallest size and 650 revolutions for the largest. It is in aspect a perfect miniature engine. The frame is rigid, spreads well at the base and resists vibration, notwithstanding the fact that the weights have been kept down to the minimum, ranging from 160



THE STURTEVANT SMALL VERTICAL ENGINE.

pounds for the smallest up to 460 for the largest engine. The steam is distributed by means of a piston valve actuated by a fly wheel governor, complete in all its features. The effect of the reciprocating parts is overcome by suitable counterbalance of the crank plates. The connecting rod is of the marine type. All moving parts are adjustable for wear, and a complete oiling system is provided for the individual bearings. The cylinder is lagged to reduce the condensation, and access to the piston valve and steam chest is provided by means of a removable cover.

This line of engines was primarily designed by the company for use with their generators in torpedo boat service, where the minimum weight was absolutely essential. The same type of engine is built to be operated by throttling governor, and is also employed for fan driving, being then directly connected to the fan shaft. The cylinder is tapped for indicator, and is also provided with the necessary drip valve connections. The small diameter of the cylinder and the extra thickness of the walls makes it possible to run these at a pressure of 150 pounds, and even higher; although the powers above specified are those developed at 60 pounds initial pressure.

The Franklin Institute Election.—The annual election of officers of the Franklin Institute led to the choice of the following: President, John Birkinbine; vice-president, Geo. V. Cresson; secretary, William H. Wahl;

treasurer, Samuel Sartain; auditor, John Geo. Cope. Managers: Daniel Baugh, R. C. H. Brock, Stephen Greene, A. C. Harrison, H. R. Heyl, Henry Howson, Alexander Krumbhaar, C. Hartman Kuhn, Benj. Smith Lyman. Committee on Science and the Arts: L. L. Cheney, Jas. Christie, G. H. Clamer, J. M. Emanuel, J. Logan Fitts, Francis Head, Chas. A. Hexamer, J. Y. McConnell, Wm. McDevitt, L. F. Rondinella, Arthur J. Rowland, Samuel Sartain, T. Carpenter Smith, Thos. Spencer, Jno. C. Trautwine, Jr.

The Mineral Industries of Michigan.

The annual report of the Mineral Commissioner of Michigan, Jas. Russell, has just been issued. It is a volume of nearly 500 pages, of which 300 are devoted to copper, half the remainder to iron and the balance to seven groups, those of Ishpeming, Negaunee, Champion, Republic, Swanzey, Cascade and Michigamme. The plan of earlier surveys of describing briefly every operating or important hole in each district is followed. Considerable space is given to the Ishpeming properties, and whatever advance has been made is noted.

The Gogebic range is, running easterly, divided into the Iron Belt, the Ironwood, the Bessemer and the Sunday Lake districts. In this portion of the report the rise of the Ashland Mine from being a worked out and decadent property 15 months before to the position of a large mine is briefly told. Possibly the thing of chief interest in connection with the Ashland is the proof it is now giving of the correctness of the views of those mining men who believed that the conditions that had produced ore in the levels explored had also produced it lower, and that concentration of ore above diorite dykes

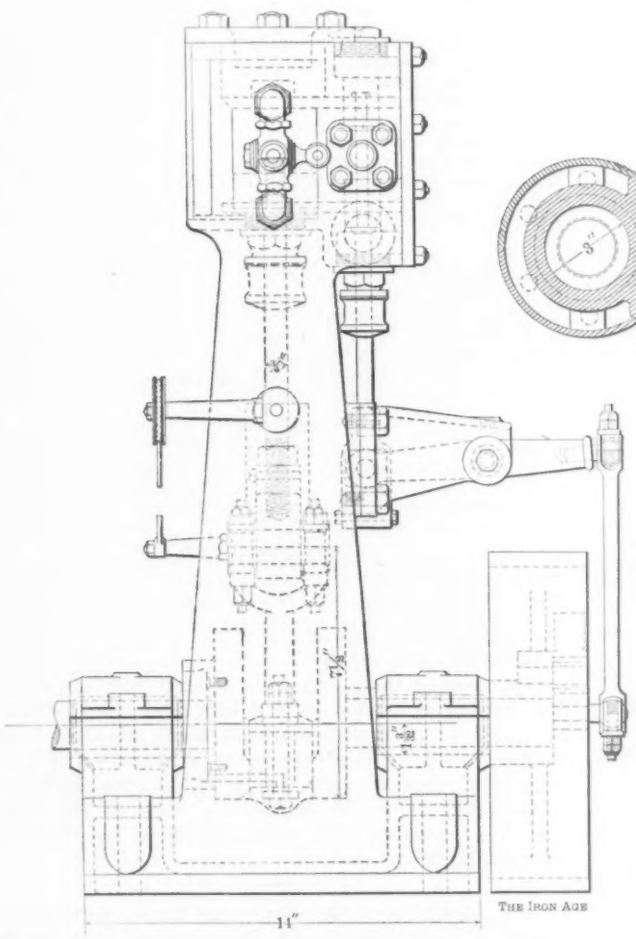


Fig 2.—Front Elevation.

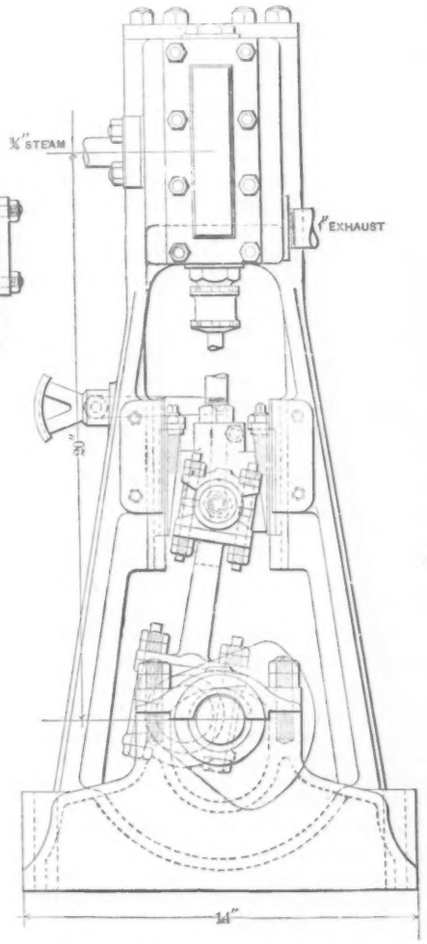


Fig. 3.– Side Elevation.

THE STURTEVANT SMALL VERTICAL ENGINE.

subsidiary mineral interests of the State, brine, coal, gold, marble and many minor minerals. It is probably the most elaborate report ever issued by a Michigan Commissioner. The work was largely done by the assistant commissioner, H. J. Stevens.

This report is unique in that it is probably the first case on record where a public official, drawing a good salary, argues at length in favor of the propriety of abolishing his office, stating that the work of the commissioner, so far as it was designed to assist in bringing in capital to develop the mineral resources, is unnecessary any longer, and so far as it relates to an annual report, is needless, private enterprise doing as well at no cost to the public. If Mr. Russell's suggestions are followed he will be the last Mineral Commissioner of Michigan.

After a brief survey of the general situation among the iron ore mines of the lake region the report takes up the Michigan ranges. The Marquette is divided into

against the footwall might continue to unknown depths. The diamond drill at the Ashland has, in the past few months, found several ore bodies under the present mine, one of these being 150 feet thick, measured nearly vertically. Some of this newly found ore is of a splendid Bessemer grade.

Speaking of the Menominee range the report says, what has frequently been noted by *The Iron Age*, that the range is capable of vast expansion, and that its present high water mark will look like an ebb tide ten years hence.

The great bulk of the report is in copper. It says: "The lake copper district is in many respects the most interesting mining field in the world. Its annual profits are greater than those of any other mining district, except the Witwatersrand. The profits of the Calumet & Hecla are the largest earned by any mine, and it is the deepest mine in the world." This portion of the report is very full. It contains a brief geological disserta-

tion of the ranges and full statistics of copper prices, production both of lake and other districts, values of production and of stocks, dividends, capital stocks, &c.; and in descriptions of mines is as full as possible. An interesting table is that on page 161, showing the percentage of annual dividends to gross value of the Michigan product from 1849 to 1900. In 1899 there was paid in dividends by the district 47.2 per cent. of the gross value of the product, and for the ten-year period ending with 1899 the percentage was 29. For the entire 50 years this percentage was 24.9.

There were 14,250 men employed in lake copper mines in 1900, and in 11 years there had been but 291 fatal accidents, or 3.26 deaths per year per 1000 employees.

The report believes there are from 15,000 to 18,000 shareholders in these copper mines, and it proceeds to summarize those in the Calumet & Hecla. Of these 75 per cent. are in New England, mostly in Boston; there are 39 shareholders in Canada and 31 in England, and 394 owning 8138 shares are in the copper country itself. It is probably safe to assert that many of these are employees of the mine. One bold flight into the future is made, and the report takes occasion to predict the decennial increases in copper production until the year 2000. It takes 50 pages to even briefly note the idle and defunct copper mines and properties of the district, 262 of them. Nearly 200 pages, on the other hand, describe quite fully the active mines.

The charcoal pig iron product of the State is given as 110,412 tons in 1899 and as 103,000 tons for the first nine months of 1900.

As to coal, it is stated that the coal area is approximately 8000 square miles, which may be increased by later exploration. The present day development is but two years old, the first mines having been opened in the Saginaw Valley in 1897. The seams now worked run from 2 to 4 feet in thickness, and are very wet. A summary of average analyses is as follows:

Moisture	7.6
Vol. carbonaceous matter	37.895
Fixed carbon	50.73
Ash	3.77
Sulphur	0.99
Brit. thermal units	12,521

Comparative evaporation tests between Hocking and Saginaw coals resulted as follows:

	Hocking.	Saginaw.
Evaporation per pound coal	8.32	8.26
Pounds coal burned square foot grate per hour	24.50	25.50
Water evaporated per square foot heating surface per hour	2.90	3.00
Horse-power developed	133.20	137.90
Per cent. moisture in coal	5.00	5.50

The mines of the State are given as 35, and the employees as about 1500.

In 1898 Michigan made 5,263,564 barrels of salt, with 57 binns engaged in the industry, with 62 blocks and 1200 solar evaporators.

Among other minerals there is brief mention of gold, silver, nickel, zinc, lead, manganese, antimony, arsenic, cobalt and pyrites, as well as a lot of non-metallic minerals, of which sandstone and marble are the most prominent. D. E. W.

The Wais & Roos Boring Mill.

The Wais & Roos Punch & Shear Company of Cincinnati have brought out a new boring mill containing many good features. Great care has been exercised in building this machine strong, where strength and rigidity are needed, also in the arrangement of every part for convenient and rapid manipulation by the operator. In the 60-inch size the table has an 8-inch spindle, is extra heavy, and though 60 inches in diameter in this case, yet the gap is sufficient to take in work 66 inches up to the hight of 10 inches above the table, and the hight under the cross rail is 40 inches, with down feed of 28 inches. There are 16 changes of speed and eight of feed, motions easily doubled up. Both heads can be operated from one side or from either, also each head can be brought up to the center for boring, or set at any angle. The right head is arranged for bar for boring cylinders, &c., and there is also a bearing in the spindle. The cross rail is raised or lowered by hand or power; the pulleys are 18 inches in diameter and speeds are 220 to 300; the weight of the machine is about 20,000 pounds.

Bids on Chicago Bridges.

Bids were opened for four steel bridges by the Chicago Drainage Canal trustees on the 16th inst. They were for structures of the bascule type over the Chicago River at Harrison street, Canal street, Main street and Ashland avenue. The American Bridge Company were the lowest bidders for the superstructure on the first three and the Massillon Bridge Company on the Ashland avenue superstructure. The four bridges, according to the lowest bid for superstructure and substructure, would cost $518,871, nearly $100,000 less than the estimate of the board. The proposals opened were as follows:

Canal Street.

Toledo Bridge Company	$79,500
King Bridge Company	81,000
Illinois Bridge Company	77,000
Massillon Bridge Company	82,400
C. L. Strobel	76,400
Phœnix Bridge Company	119,352
Indiana Bridge Company	84,990
Hansel, Elock Foundry Company	77,500
Milwaukee Bridge & Iron Company	83,000
American Bridge Company	72,800

Ashland Avenue.

Toledo Bridge Company	$95,000
King Bridge Company	117,000
Massillon Bridge Company	91,200
C. L. Strobel	102,200
Indiana Bridge Company	107,900
Milwaukee Bridge Company	115,000
American Bridge Company	94,000

Harrison Street.

Toledo Bridge Company	$104,000
King Bridge Company	99,000
C. L. Strobel	97,980
Milwaukee Bridge & Iron Company	98,900
American Bridge Company	86,800

Main Street.

Toledo Bridge Company	$98,000
King Bridge Company	94,000
C. L. Strobel	91,200
Milwaukee Bridge Company	93,700
American Bridge Company	72,800

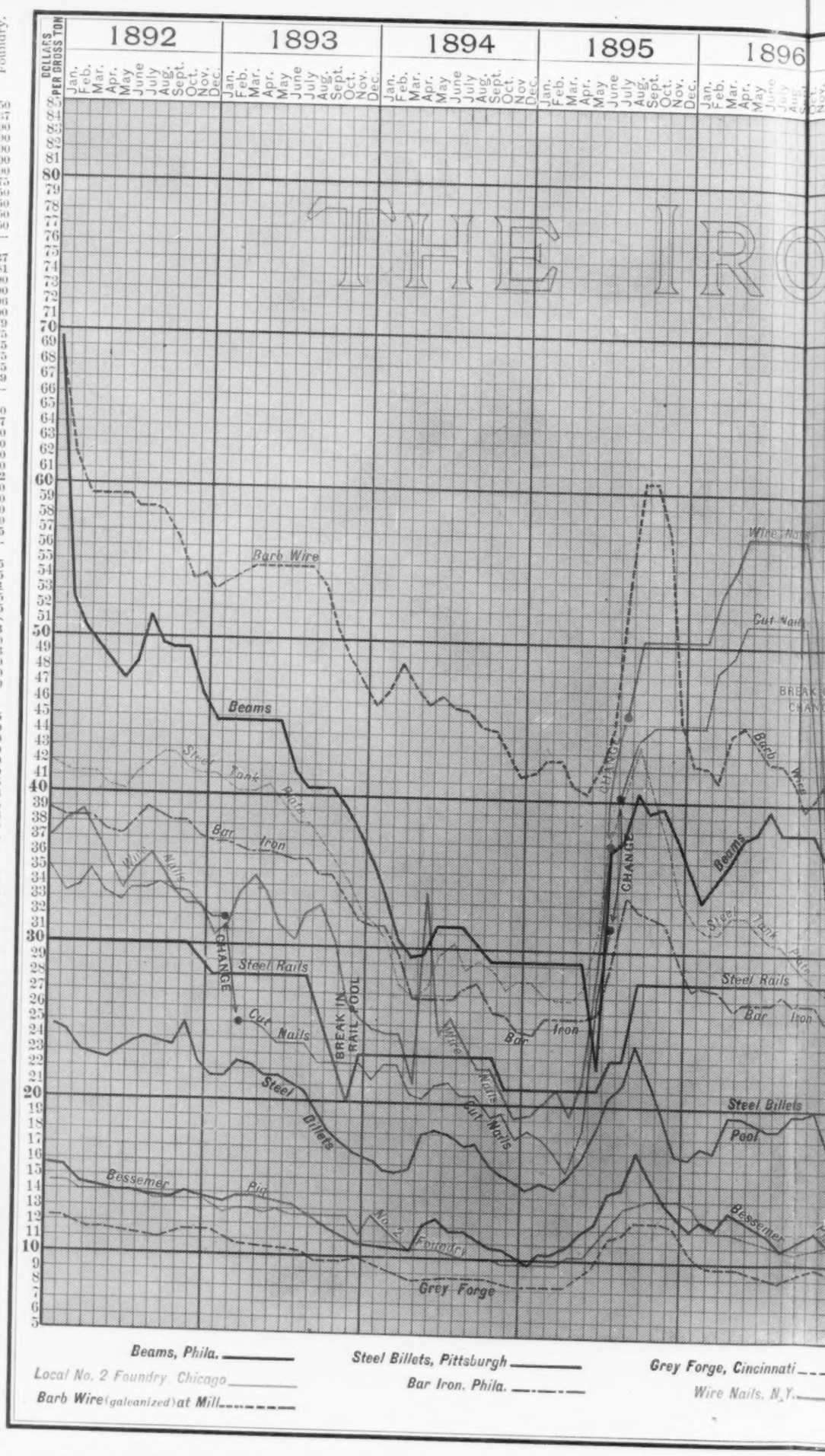
Members of the board were pleased with the result, the bids being 20 per cent. lower than were received in August, when all proposals were rejected. They considered the reduced figures as confirmation of their supposition last summer that a combination had been effected among bridge builders in view of the many structures contemplated by the board in the replacing of the old type of bridges.

The Atchafalaya, Red River and Bayou Bœuf Levee Board at New Orleans, La., have invited bids for the construction of a system of canals to drain and bring under cultivation nearly 1,000,000 acres of Louisiana swamp land. All of the land is alluvial, and lies below the level of the surrounding streams at high water, and is therefore subject to overflow. But it is believed that it can be redeemed and converted into a valuable agricultural district. If the plan is successful it is contemplated to carry the reclamation system into the balance of the 7,000,000 or 8,000,000 acres of swamp land in Louisiana.

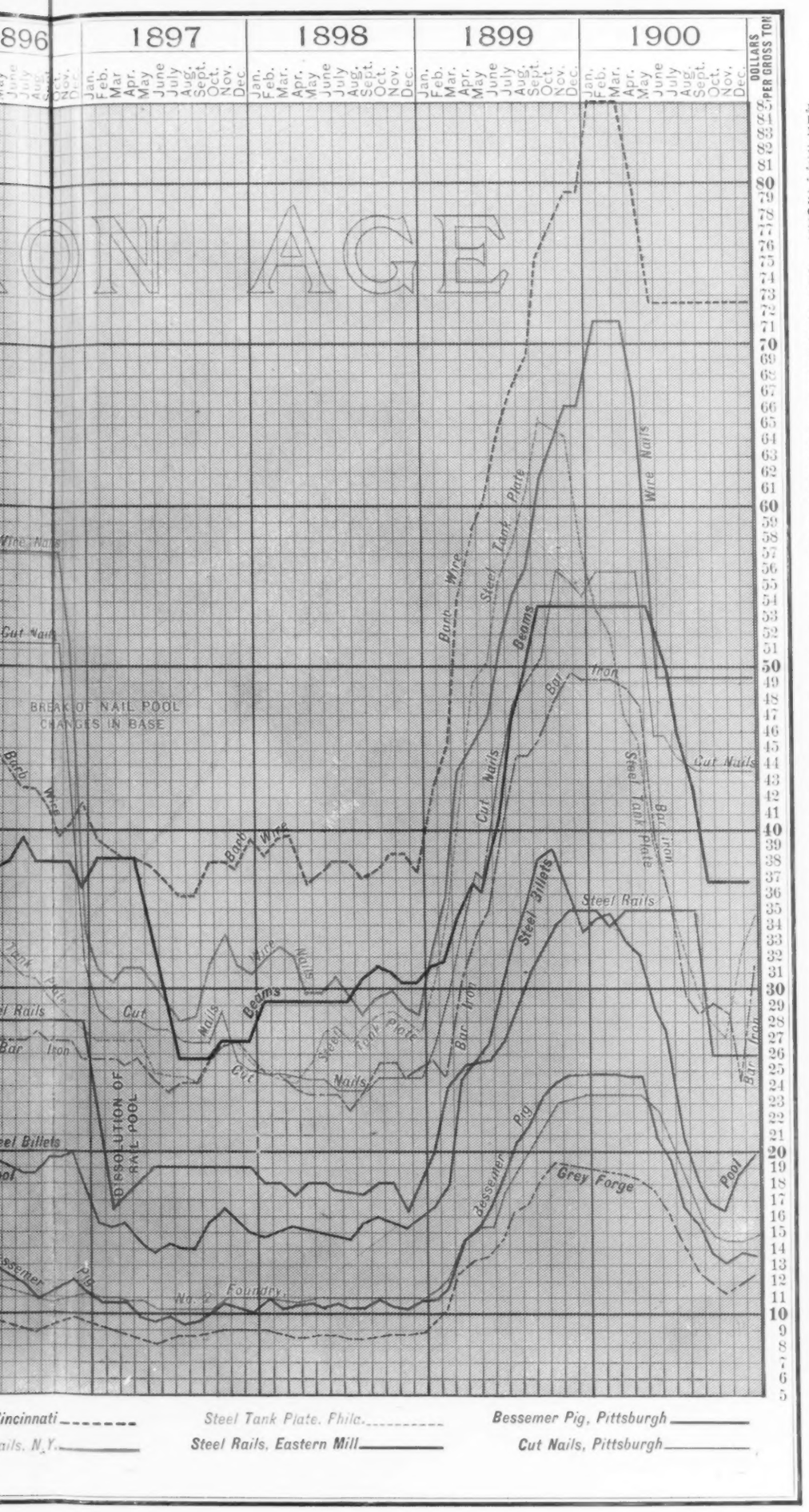
The Schultz Bridge & Iron Company have been awarded the contract for a pier and warehouse at Progresso, Yucatan, Mexico, for the Compania del ferro carril Muelle y Almacenes del Commercio. The pier is to be constructed for a double track railroad, and will be 40 feet wide and 550 feet long; 8-inch solid steel piles will be used.

Tyroller & Bro., scrap dealers, Philadelphia, Pa., have just received three carloads of old 3-inch shells, which were made for use in the Hotchkiss guns during the Rebellion. They were shipped from Fortress Monroe, and after the metal plugs and bands are removed will be sold as scrap iron.

Month.	Bessemer Pig.	Steel Billets.	Southern Grey Forge.	Local No. 2 Foundry.
1892				
Jan.	15.69	25.00	12.25	14.50
Feb.	15.31	24.36	12.25	14.37
March	14.60	23.00	11.95	14.00
April	14.47	22.81	11.75	14.00
May	14.27	22.41	11.75	14.00
June	14.05	22.97	11.65	14.00
July	14.00	25.50	11.37	14.00
Aug.	13.83	25.81	11.19	13.75
Sept.	13.78	25.65	11.00	13.50
Oct.	13.65	25.53	11.31	13.50
Nov.	13.98	24.94	11.71	13.50
Dec.	13.75	22.40	11.50	13.50
1893				
Jan.	13.46	21.56	11.50	13.37
Feb.	13.32	21.62	11.12	12.81
March	13.63	22.60	10.90	13.00
April	13.65	22.44	10.75	13.00
May	13.41	21.69	10.69	12.96
June	13.37	21.70	10.50	13.00
July	13.07	21.06	10.44	12.79
Aug.	12.57	20.45	10.15	12.75
Sept.	12.16	19.31	9.94	12.75
Oct.	11.44	18.06	9.75	12.75
Nov.	11.17	17.37	9.80	12.75
Dec.	10.87	16.69	9.94	11.69
1894				
Jan.	10.66	16.12	9.75	12.50
Feb.	10.61	15.75	9.44	11.87
March	10.40	15.55	9.00	11.30
April	10.39	15.69	8.50	10.50
May	12.00	18.00	8.50	10.50
June	12.31	18.12	8.62	10.50
July	11.70	18.00	8.75	10.12
Aug.	11.71	17.15	8.80	10.00
Sept.	11.29	17.19	8.75	10.00
Oct.	10.89	16.00	8.75	10.00
Nov.	10.61	15.57	8.50	9.70
Dec.	10.20	15.12	8.37	9.75
1895				
Jan.	9.93	14.90	8.25	9.75
Feb.	10.07	14.95	8.25	9.75
March	10.19	14.84	8.25	9.81
April	10.68	15.44	8.25	10.25
May	11.64	16.30	8.75	10.25
June	12.33	18.63	9.88	10.87
July	14.38	20.75	11.38	12.13
Aug.	14.63	21.75	11.50	13.20
Sept.	17.02	24.00	12.50	13.63
Oct.	15.45	21.90	12.50	14.00
Nov.	13.72	19.13	12.50	14.00
Dec.	12.67	16.97	12.25	14.00
1896				
Jan.	12.00	16.80	10.55	13.55
Feb.	12.63	17.38	9.75	12.50
March	12.32	17.09	9.58	12.00
April	13.10	19.53	9.35	12.00
May	12.64	19.50	9.50	11.69
June	12.35	19.12	9.44	11.50
July	11.88	18.85	9.00	11.25
Aug.	10.95	18.75	8.75	11.18
Sept.	11.25	19.75	9.00	10.75
Oct.	11.62	19.75	9.20	10.88
Nov.	12.05	20.00	9.94	11.19
Dec.	11.24	17.50	9.60	11.25
1897				
Jan.	10.56	15.42	9.31	11.02
Feb.	10.60	15.25	9.00	11.00
March	10.52	15.44	8.94	10.88
April	9.82	14.60	8.40	10.75
May	9.32	13.82	8.19	10.38
June	9.56	14.06	8.25	10.25
July	9.25	14.00	8.45	10.25
Aug.	9.33	14.00	8.45	10.25
Sept.	10.09	15.60	8.80	10.40
Oct.	10.45	16.44	9.00	11.00
Nov.	10.23	15.57	9.00	11.00
Dec.	10.01	15.00	9.00	11.00
1898				
Jan.	9.87	14.93	9.00	11.00
Feb.	10.05	15.06	8.75	10.93
March	10.39	15.25	8.55	10.75
April	10.41	15.06	8.50	10.91
May	10.30	14.85	8.62	11.00
June	10.34	14.65	8.55	11.00
July	10.25	14.50	8.38	11.00
Aug.	10.35	15.85	8.37	11.00
Sept.	10.78	16.00	8.55	11.00
Oct.	10.36	15.56	8.75	11.00
Nov.	10.15	15.06	8.75	11.00
Dec.	10.58	15.80	8.90	11.00
1899				
Jan.	10.87	16.62	9.56	11.12
Feb.	11.60	18.00	10.42	12.12
March	14.59	24.30	12.70	14.60
April	15.63	25.37	13.25	15.12
May	16.20	26.75	13.43	15.37
June	18.51	30.10	14.85	17.60
July	20.65	33.12	16.06	18.87
Aug.	21.75	35.40	16.70	20.30
Sept.	23.43	38.37	18.43	21.87
Oct.	24.18	38.75	19.31	23.00
Nov.	24.78	36.50	19.05	23.10
Dec.	24.90	33.75	19.00	23.50
1900				
Jan.	24.90	34.50	18.93	23.50
Feb.	24.80	34.87	18.75	23.50
March	24.72	33.00	18.40	23.50
April	24.70	32.00	18.18	23.37
May	21.00	28.90	17.35	22.30
June	19.72	27.25	16.00	20.37
July	16.75	21.00	14.31	18.25
Aug.	15.60	18.20	12.35	15.90
Sept.	13.87	16.93	11.87	15.00
Oct.	13.06	16.50	11.31	14.50
Nov.	13.48	18.95	11.90	14.50
Dec.	13.43	19.75	12.50	14.73



FLUCTUATIONS IN THE PRICES OF CRUDE
FROM JANUARY 1, 1892, T



Month.	Cut Nails.	Steel Tank Plate.	Beams.	Bar Iron.	Barb Wire.	Wire Nails.
1892						
Jan.	1.55	1.87	3.10	1.71	3.05	1.67
Feb.	1.49	1.85	2.36	1.70	2.77	1.71
March	1.50	1.85	2.25	1.70	2.65	1.73
April	1.55	1.84	2.20	1.70	2.65	1.66
May	1.48	1.76	2.15	1.67	2.65	1.60
June	1.47	1.75	2.10	1.67	2.65	1.50
July	1.50	1.84	2.15	1.70	2.62	1.57
Aug.	1.50	1.99	2.30	1.74	2.62	1.61
Sept.	1.51	1.90	2.32	1.72	2.60	1.57
Oct.	1.50	1.90	2.20	1.70	2.52	1.50
Nov.	1.49	1.87	2.20	1.70	2.41	1.47
Dec.	1.45	1.85	2.07	1.66	2.42	1.46
1893						
Jan.	1.42	1.85	2.00	1.65	2.37	1.57
Feb.	1.42	1.82	2.00	1.65	2.40	1.39
March	1.15	1.80	2.00	1.63	2.42	1.50
April	1.15	1.80	2.00	1.62	2.45	1.55
May	1.10	1.80	2.00	1.62	2.45	1.51
June	1.05	1.75	2.00	1.61	2.45	1.39
July	1.05	1.70	1.85	1.60	2.45	1.35
Aug.	1.05	1.70	1.80	1.60	2.45	1.44
Sept.	1.00	1.65	1.80	1.55	2.40	1.45
Oct.	1.00	1.60	1.80	1.55	2.26	1.30
Nov.	1.00	1.55	1.75	1.49	2.15	1.18
Dec.	1.00	1.45	1.67	1.42	2.10	1.12
1894						
Jan.	0.95	1.42	1.59	1.41	2.05	1.10
Feb.	0.99	1.35	1.49	1.40	2.09	1.09
March	0.99	1.24	1.35	1.33	2.15	1.09
April	0.91	1.20	1.30	1.20	2.10	0.94
May	0.90	1.22	1.31	1.20	2.05	1.05
June	0.94	1.32	1.40	1.20	2.07	1.11
July	0.95	1.35	1.40	1.20	2.05	1.14
Aug.	0.90	1.27	1.40	1.22	2.03	1.07
Sept.	0.90	1.30	1.35	1.24	2.00	0.99
Oct.	0.85	1.29	1.30	1.16	1.99	0.99
Nov.	0.86	1.24	1.30	1.15	1.90	0.92
Dec.	0.80	1.25	1.30	1.11	1.85	0.85
1895						
Jan.	0.81	1.25	1.30	1.10	1.86	0.86
Feb.	0.80	1.21	1.30	1.15	1.89	0.90
March	0.76	1.20	1.30	1.15	1.89	0.94
April	0.70	1.20	1.30	1.15	1.83	0.87
May	0.81	1.24	1.31	1.15	1.81	0.97
June	1.19	1.39	1.43	1.16	1.89	1.27
July	1.43*	1.68	1.65	1.28	2.00	1.68*
Aug.	1.80	1.81	1.66	1.50	2.40	2.05
Sept.	1.96	1.95	1.82	1.46	2.70	2.25
Oct.	2.00	1.81	1.75	1.44	2.70	2.25
Nov.	2.00	1.68	1.76	1.40	2.56	2.25
Dec.	2.00*	1.50	1.69	1.33	2.03	2.25*
1896						
Jan.	2.00	1.43	1.60	1.23	1.90	2.25
Feb.	2.00	1.40	1.50	1.24	1.89	2.25
March	2.15	1.40	1.55	1.23	1.85	2.40
April	2.21	1.44	1.60	1.18	1.97	2.46
May	2.30	1.45	1.68	1.20	2.00	2.55
June	2.30	1.40	1.70	1.20	1.95	2.55
July	2.30	1.38	1.76	1.20	1.87	2.55
Aug.	2.30	1.35	1.70	1.21	1.85	2.55
Sept.	2.30	1.31	1.70	1.20	1.80	2.55
Oct.	2.30	1.27	1.70	1.20	1.73	2.55
Nov.	2.09	1.25	1.70	1.20	1.76	2.29
Dec.	1.41	1.23	1.62	1.15	1.84	1.51
1897						
Jan.	1.28	1.20	1.70	1.15	1.76	1.39
Feb.	1.25	1.20	1.70	1.15	1.73	1.35
March	1.25	1.20	1.70	1.14	1.70	1.40
April	1.25	1.20	1.70	1.15	1.70	1.40
May	1.23	1.11	1.49	1.10	1.68	1.35
June	1.23	1.10	1.25	1.07	1.64	1.31
July	1.20	1.10	1.15	1.08	1.60	1.25
Aug.	1.19	1.08	1.15	1.08	1.60	1.26
Sept.	1.19	1.14	1.15	1.14	1.70	1.41
Oct.	1.28	1.15	1.20	1.19	1.70	1.49
Nov.	1.14	1.14	1.20	1.20	1.69	1.41
Dec.	1.12	1.13	1.20	1.15	1.75	1.39
1898						
Jan.	1.10	1.10	1.30	1.11	1.71	1.42
Feb.	1.10	1.10	1.30	1.11	1.75	1.45
March	1.10	1.08	1.30	1.06	1.77	1.43
April	1.08	1.12	1.30	1.05	1.65	1.31
May	1.08	1.21	1.30	1.05	1.66	1.31
June	1.06	1.23	1.30	1.05	1.70	1.35
July	1.06	1.20	1.30	1.00	1.70	1.31
Aug.	1.05	1.23	1.37	1.06	1.65	1.26
Sept.	1.08	1.27	1.40	1.14	1.67	1.32
Oct.	1.10	1.27	1.38	1.13	1.71	1.33
Nov.	1.10	1.25	1.35	1.10	1.71	1.28
Dec.	1.10	1.26	1.35	1.11	1.67	1.27
1899						
Jan.	1.18	1.35	1.40	1.15	1.88	1.43
Feb.	1.32	1.55	1.42	1.20	2.02	1.57
March	1.48	1.89	1.55	1.41	2.42	1.94
April	1.67	2.18	1.64	1.50	2.60	2.05
May	1.65	2.23	1.63	1.56	2.70	2.10
June	1.97	2.48	1.82	1.81	2.90	2.30
July	2.12	2.58	2.08	2.00	3.02	2.42
Aug.	2.20	2.72	2.20	2.00	3.10	2.50
Sept.	2.45	2.92	2.40	2.05	3.36	2.76
Oct.	2.50	3.00	2.40	2.13	3.47	2.87
Nov.	2.48	2.87	2.40	2.21	3.55	2.95
Dec.	2.45	2.48	2.40	2.20	3.55	2.95
1900						
Jan.	2.50	2.38	2.40	2.20	3.80	3.20
Feb.	2.50	2.32	2.40	2.20	3.80	3.20
March	2.50	2.10	2.40	2.18	3.80	3.20
April	2.50	2.02	2.40	2.12	3.55	2.95
May	2.05	1.75	2.40	1.77	2.80	2.20
June	2.05	1.60	2.22	1.56	2.80	2.20
July	1.97	1.37	2.05	1.33	2.80	2.20
Aug.	1.95	1.30	1.89	1.28	2.80	2.20
Sept.	1.95	1.25	1.65	1.30	2.80	2.20
Oct.	1.95	1.21	1.65	1.28	2.80	2.20
Nov.	1.95	1.44	1.65	1.28	2.80	2.20
Dec.	1.95	1.54	1.65	1.42	2.80	2.20

* Change of base.

RUDE AND FINISHED IRON AND STEEL
92, TO JANUARY 1, 1901.

The German Machine Tool Manufacturers and American Methods.

The Association of German Machine Tool Manufacturers has issued an elaborate appeal which is interesting from a number of points of view, and is reproduced herewith:

Among the branches of German industry which have greatly developed during the last decade is the German manufacture of machine tools, whose importance will be recognized in the new tariff by establishing a special chapter for machine tools.

For a long time this branch has suffered from foreign, and particularly from American competition. To a hightened degree it has suffered from the prejudice which exists in Germany in favor of American products of this type. Aside from the well known love of the Germans for everything that comes from foreign countries, it has been the peculiar development of the American business system which has created this opinion prejudicial to national work.

In the United States of America, in which all manufacturing is carried on on a large scale, an enormous activity has developed in the production of machine tools. This has brought about that this branch has developed to a very great extent, particularly through production on a factory scale, and through the subdivision of labor. In these respects it has been like the building of other machines for manufacturing on a large scale, and like the production of specialties like sewing machines, and, more recently, bicycles. It is the principle of the so-called specializing of industry which in this branch has been universally applied in the United States. Added to this is extensive activity in selling by the establishment of large agencies, by sending representatives to foreign countries, and, finally, by puffing in the press and in technical societies in a pronounced manner, in which the means are not always scrupulously selected. All this has led to an enormous development of the American machine tool manufacture, and to the building of machines for machine shop purposes of other kinds.

The German manufacture of machine tools has not always been started, like the American, on a large scale and on the line of specializing. It has developed in quite a different way, and thereby has not secured the advantage of great capitalistic undertakings to the same extent as the American. Still, it is fully the equal of the American, so far as solidity and completeness of its products are concerned, and in many respects is superior to it. If in certain poorly informed circles a prejudice still exists in favor of the American against the German, that is due to a considerable extent to the systematic propoganda which the American machine tool makers carry on in favor of their products.

Occurrences of this kind have taken place during the last few months in Germany, particularly on the occasion of the opening of the German Niles Machine Tool factory at Oberschoenweide, near Berlin. This was utilized to make statements serving to glorify the American business, and it was reproduced by a large part of the press without criticism. This plant, arranged according to the American system, has been created with the cooperation of Aktiengesellschaft Loewe & Co. and the Allgemeine Elektrizitaets Gesellschaft, and several leading banking houses of Berlin. Although to this extent it is a German undertaking, the deliberate glorification of American enterprises and of American product in this branch must favor an opinion adverse to national industry. This is all the more the case since the praise which partly rests upon inadequate understanding of conditions does go beyond the limit of the permissible.

The circular recently issued by this German Niles Company illustrates how the praise of foreign industry is utilized for business purposes in behalf of a single undertaking. In the document referred to the opinion as to the German machine tool trade is expressed in a manner highly injurious to German work. Thus the following statement is made in the introduction to this business circular, after having dwelt upon the general favor with which American machine tools are received:

"The exports of such machines from America to Europe has very greatly developed in recent years, the Americans having the advantage that there is no effective competition on the whole of the European Continent because no factory existed which could rival the American works so far as excellence of product is concerned. Therefore considerably higher prices were paid for the American machines than would have been paid under ordinary circumstances, and these prices were rendered even higher by the addition of freight and of the duty."

The exaggeration shown by this statement is so obvious that it has created indignation even in those circles of German industry which are not directly affected. The statement contains a direct untruth and therefore deserves to be sharply controverted. It is a fact well known in business circles that the German machine tool manufacture for years has met fully all the requirements called for in the production of heavy machines in the machinery trade and for the working of iron and steel. It is a fact that the great German steel works, whose extraordinary capacity is a highly satisfactory and patent fact, use almost exclusively German machines. Where are to be found in the great works of Westphalia, Silesia, in the Saar district, and in South Germany, the heavy American machine tools which no German product can beat in reference to quality?

What machine tools are employed in our iron and steel industry and in machinery building are generally such smaller and middle sized machines as are used for the production of smaller parts. These, aside from their generally light construction, have proved satisfactory for this purpose. The extensive introduction of this class of American machine tools is partly explained by the readiness with which they may be procured, since they are manufactured in quantities, by the fact that they are pushed vigorously in a business way, and by the fact that during the recent years of economic development the home machine tool makers were so crowded with orders that they were generally forced to ask for long term deliveries. To-day, when the enormous and extensive enlargements and additions in the German machine tool business have been completed, the necessity for meeting the requirements by buying foreign productions has grown very much less.

What the German Niles Tool Company, according to their own statement, desire to do, namely, the building of heavy machine tools in finished form, that has been done long ago by the German works in a manner acknowledged both at home and abroad, and the proof thereof is furnished by the growing exports of such German machines to large foreign works. It is not saying too much, but it corresponds with the facts, that it is just in respect to heavy machine tools that the German industry need fear no comparison, and this has been confirmed by German engineers during their visits to American workshops.

The Paris Exposition, which has helped the American machine tool business, represented there by many machines, selling regularly in the market, has led to renewed glorification in the German press; but that show cannot be regarded as a measure of the capacity of the German machine tool industry. It is a well known fact that it was just the German machine industry and the iron industry which, generally speaking, kept away from the Paris Exposition altogether. Therefore few of the machine tool works of Germany exhibited in Paris. To the extent, however, that the German machine tool industry did so, its products furnished as brilliant a representation of German manufacture as did the engine building industry and the electrical industry.

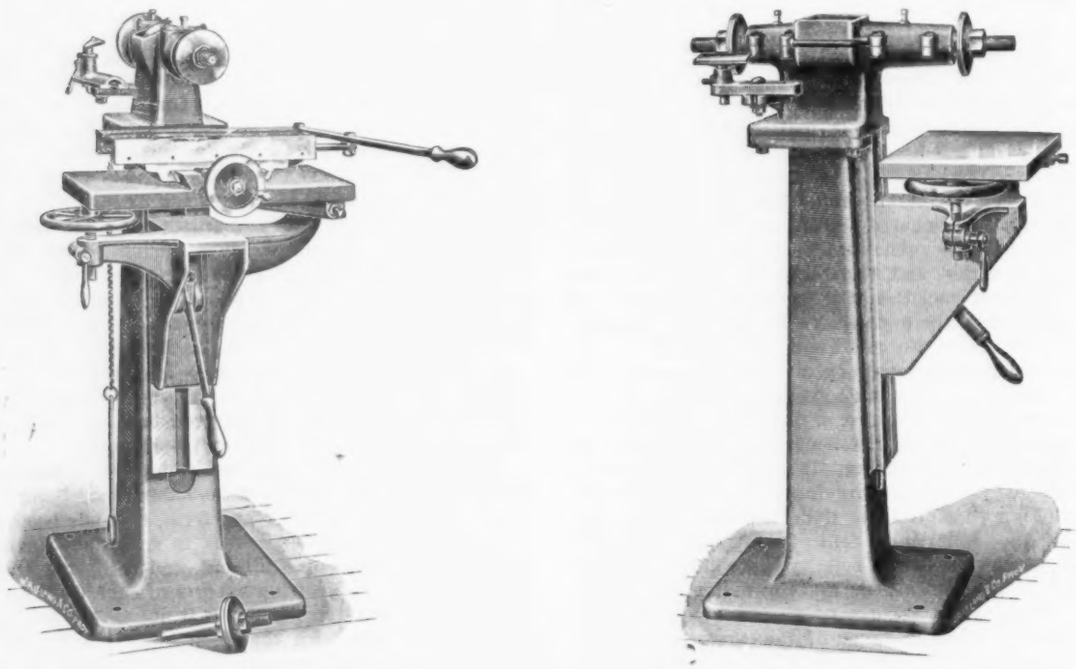
We consider it a duty to the German industry to say a word for the German machine tool works to meet the exaggerated praise of the American industry, particularly on the part of certain Berlin circles, and particularly against the exaggeration of the merits of American designers of machine tools. The economic importance of the German machine tool manufacture has been clearly brought to light in the investigations which the Verein Deutscher Werkzeug Maschinen Fabriken has undertaken in connection with preliminary work for the new tariff bill. The manufacture of machine tools occupies a prominent position in the tool machinery business

of Germany, which, according to the investigations and estimates made at this occasion, amounts to one thousand million marks in value. It produces from one-twelfth to one-tenth of this value, and about one-quarter thereof is exported in competition with foreign machines, its products receiving recognition and utilization in a growing manner. How would this be possible if it could not meet any competition? The German machine industry need fear no criticism. Nor does it ask any special economic advantages on the part of the German consumers of machine tools; but what it may demand with justice from works of national pride which require machine tools is that an unprejudiced examination of its products be made with reference to quality of construction and capacity to do work. In making this comparison with foreign products reference should be had to differences in price created by state conditions.

The above circular furnishes a good illustration of German jingoism.

Combined Surface Grinder and Grinder Head.

The Builders Iron Foundry of Providence, R. I., are building a combined surface grinder and grinder head which is convenient for grinding gibs, dies, keys or similar work, or for finishing many of the flat surfaces ground in tool rooms. The spindle is arranged for two wheels, and a rest of the kind common on grinder heads is provided for use in connection with the wheel in the back of the machine, so that this machine is also suitable for grinding small tools and a great variety of other work common in shops or tool rooms. The knee is counterbalanced so that it may be easily raised or lowered, and when the table has been set approximately by clamping the knee, a fine adjustment through a distance of 1½ inches may be obtained by means of the hand wheel shown at the left in the first cut. The table is passed lengthwise beneath the wheel by the hand lever at the right, or transversely by the small hand wheel in the front, and the levers and hand wheel shown are conveniently reached at all times by the person operating the machine. The table is 14 inches long, 6 inches wide, and has a T-slot. The bearings are ample, and are lined with anti-friction metal, and are furnished with ring oilers. Provision is made for protecting the bearings from dust and dirt, and for taking the end thrust of the spindle. This machine uses wheels 12 inches in diameter, 2 inches face and 1 inch hole. For finishing certain classes of work the sliding table is unnecessary; and for those who desire a machine without this table the builders furnish the same machine with a plain flat table, which, however, has the same arrangement for adjustment as the sliding table. This plain table is 18 inches long by 10 inches wide.



THE BUILDERS IRON FOUNDRY COMBINED SURFACE GRINDER AND GRINDER HEAD.

Electricity at the Pan-American Exposition at Buffalo.

The Pan-American Exposition Company have made a contract with the Cataract Power & Conduit Company of Buffalo, distributing agents for Niagara power, for 5000 electrical horse-power to be furnished at the exposition grounds. This power will be generated in the central station of the Niagara Falls Power Company at a voltage of 2200, two phase, and it will pass from the generating station to the transformer station adjoining, where it will have its voltage raised to 22,000, three phase, and at this pressure it will be transmitted to the Niagara street terminal station in Buffalo. In the terminal station the current will be stepped down to 11,000, and will then pass over a special transmission line extending from the terminal station to the exposition grounds, a distance of 13,000 feet. This special transmission line carries six bare copper cables of 00 wire and reaches the exposition grounds near Groat street and Elmwood avenue. When they reach the grounds the cables drop into the rheostat for dimming effects and then pass on under ground, after converging in three lead covered copper cables of 300,000 c. m., to the transformer service station in General Electric Company's exhibit in the Electricity Building. Here the current is again stepped down to 1800 volts, and at this pressure it is distributed throughout the grounds to the numerous distributing transformers, which still further reduce it to 104 volts for use at the lamps.

The transformer plant of the exposition will consist of 18 air-blast transformers of General Electric form GI and will be equipped with blowers operated by electric motors. The switchboards will be of blue Vermont marble, fitted with oil switches operated pneumatically. This plant will control the entire decorative lighting system throughout the grounds, and will of itself be an exhibit. It will be adjacent to the General Electric Company's main exhibit, which is to be the largest ever attempted by that company.

In addition to this there will be a patrol and auxiliary plant intended to carry the necessary current for the all night lighting and the lighting for police purposes. This plant will also supply 500 volt and 110 volt service throughout the grounds, and this will do away with the

necessity of resorting to the rotary transformer service. The patrol and auxiliary plant will contain apparatus part of an exhibit by the Westinghouse Electric & Mfg. Company. It will consist of one 60-cycle alternator having a capacity of 180 kw.; four power generators, 500 volt d. c., capacity 225 kw. each; two 110-kw., 110 volt d. c. generators, and 15 Brush arc machines. The Electricity Building is to be the main distributing point, and the circuits from these machines, except the all night arc lighting service, will run to that building. The electrical service of the exposition will be further augmented by the use of a 600-kw., 60-cycle alternator located in the Westinghouse exhibit in the Electricity Building, and this unit will be devoted entirely to the service of the concessionaires' and exhibitors' lights.

At the Pan-American Exposition the combinations of light and water effects are to be very magnificent; so much so that the pumping installation is almost a part of the electrical exhibit, so closely will the two be allied. The pumping station will be located in the court of the Machinery and Transportation Building. It will consist of 12 pumps made by P. H. & F. M. Roots of Connersville, Ind., the capacity of which will be 35,000 gallons of water per minute. These pumps are to be run by steam engines of the following makes: American Engine Company, Bound Brook, N. J.; Murray Iron Works, Burlington, Iowa; Lane & Bodley, Cincinnati; Ames Iron Works, Oswego, N. Y.; Harrisburg Engine Company, Harrisburg, Pa.; Fitchburg Steam Engine Company, Fitchburg, Mass.; Watertown Engine Company, Watertown, N. Y.; and by gas engines of these makes: Struthers, Wells & Co., Warren, Pa.; National Meter Company, New York, N. Y.; Bessemer Gas Engine Company, Grove City, Pa.; Marinette Iron Works Mfg. Company, Marinette, Wis., and J. L. Alberger, Buffalo, N. Y. These engines will all be belted to their respective pump units, and are required to be in service from 10 a.m. to 11.15 p.m. each day, serving the fountain displays at the electric tower and basin and also the Court of Fountains basin, including the Fountain of Abundance. The pumps will take water from an intake located at the north end of the Court of Fountains basin through a 48-inch riveted suction pipe and delivered by the pumps through 16-inch and 20-inch pipes at a pressure of 110 pounds per square inch to the fountain orifices.

In the court of the Machinery and Transportation Building there will also be four engine generator units. Two of these will be furnished by the D'Olier Engine Company of Erie, Pa., and will be used to serve the projector display which lights up the spectacular display fountains in the electric tower basin. Another of these units will be supplied by the Erie Ball Engine Company. It will be a direct connected unit, furnishing 110 volt, d. c., service for arc lights in the plant itself and also for decorative incandescent lighting around the arcade which surrounds the court of the Machinery and Transportation Building. The other unit will also be a direct connected one furnished by the American Engine Company of Bound Brook, N. J., and will be used for furnishing arc lights for the horticulture group, as well as for supplying current to a storage battery station near the Streets of Venice concession, the battery to be used for charging the electric launches on the exposition canals.

Copper Sheathed Coaches.—The Wason Mfg. Company, Brightwood, Mass., are building 25 passenger coaches for the Erie and four coaches for the New Jersey & New York, duplicates of those for the Erie, all of which are to be sheathed with copper on the exterior.

The molders employed by Fraser & Chalmers, Chicago, have struck on account of the discharge of six members of their union, and have demanded the dismissal of the general superintendent for tyrannical conduct. The president of the Iron Molders' Union of North America ordered them to return to work, pending the settlement of the difficulty by arbitration, but they refuse to do so.

The Connellsville Coke Trade in 1900.

The coke trade in 1900, both as regards tonnage and prices realized, was ahead of all previous records. During the year the Connellsville region marketed 10,166,234 tons of coke, and the estimate made by the Connellsville *Courier* states that the operators received an average price of $2.70 per ton, making the value of the product at the ovens reach the enormous sum of $27,448,332. This average price of $2.70 per ton is probably a little higher than it should be, but it is a fact that furnace coke ranged all the way from $2.25 up to $4 a ton in 1900, and foundry from $2.50 to $4.25. The following tabulated statement printed in the *Courier* shows the total number of ovens at the close of each year, annual output, average price and gross revenue of the region from 1880 to date:

Year.	Total ovens.	Tons shipped.	Average price.	Gross revenue.
1880.....	7,211	2,205,946	$1.79	$3,948,643
1881.....	8,208	2,639,002	1.63	4,301,573
1882.....	9,283	3,043,394	1.47	4,473,889
1883.....	10,176	3,552,402	1.14	4,049,738
1884.....	10,543	3,192,105	1.13	3,607,078
1885.....	10,471	3,096,012	1.22	3,777,134
1886.....	10,952	4,180,521	1.36	5,701,086
1887.....	11,923	4,146,989	1.79	7,437,669
1888.....	13,975	4,955,553	1.19	5,884,081
1889.....	14,458	5,930,428	1.34	7,974,663
1890.....	16,020	6,464,156	1.94	12,537,370
1891.....	17,204	4,760,665	1.87	8,903,454
1892.....	17,256	6,329,452	1.83	11,598,407
1893.....	17,513	4,805,623	1.49	7,141,031
1894.....	17,834	5,454,451	1.00	5,454,451
1895.....	17,947	8,244,438	1.23	10,140,658
1896.....	18,351	5,411,602	1.90	10,282,043
1897.....	18,628	6,915,052	1.65	11,409,835
1898.....	18,643	8,460,112	1.55	13,113,179
1899.....	19,689	10,129,764	2.00	20,259,528
1900.....	20,954	10,166,234	2.70	27,448,832

The following table shows the shipments of 1900 by months in cars and tons, with the average number of cars shipped each working day in the month:

Month.	Cars.	Daily average.	Tons.
January	50,939	1,887	1,001,882
February	47,889	1,995	910,729
March	52,493	1,944	1,044,588
April	49,738	1,990	982,551
May	46,410	1,720	934,186
June	42,971	1,653	872,316
July	35,436	1,363	732,981
August	34,190	1,266	698,065
September	32,982	1,319	673,336
October	35,680	1,322	734,748
November	36,020	1,385	751,443
December	39,662	1,586	829,409
Totals.....	504,410	1,619	10,166,234

A glance at the record of the past 20 years shows how wonderfully the coke trade of the Connellsville region has grown in spite of the very many and very extensive coking fields opened in other sections. In 1880 the output was only 2,205,000 tons. It rose gradually in the next decade until in 1890, a boom year in iron, it reached the then enormous total of 6,464,000 tons. Two years of depression followed in which the output ranged from 4,000,000 to 5,000,000 tons. In 1895 came another boom that sent production up to the theretofore undreamed of figure of 8,244,000 tons. The very next year, however, it dropped to 5,411,000 tons, but quickly recovered, and in 1898 showed a total of 8,460,000 tons, a greater output than that of 1895. This was, however, only a starter. The output of 1899 and that of the past year, as noted above, exceeded 10,000,000 tons each year.

With all the improvements in modern coking, there was a return to primitive methods this year. During the opening months of the year all the coke shipped was not burned in the ovens. There was such a demand for coke that it could not be supplied by the ovens of some of the operators who had orders, and they burned it on the ground in the open air. One firm made quite a quantity of coke in this old fashioned manner.

The name of the firm of Uehling, Steinbart & Co., Limited, makers of engineering and metallurgical instruments of 40 and 42 Fourth street, Carlstadt, N. J., has been changed to Uehling-Steinbart Company.

Great Britain's Exports of Iron and Machinery.

Now that we have become active competitors of the iron and machinery manufacturers of Great Britain in many branches, it will prove interesting to study the export figures of that country with reference to both the volume of the business and the channels into which it flows. The trade and navigation returns for the year 1900 offer an opportunity for such a study.

Starting with pig iron, it will be noted that Great Britain's export still is many times greater than our own, as the following table shows:

English Exports of Pig Iron.

	1899. Gross tons.	1900. Gross tons.
Russia	82,005	21,270
Sweden	71,340	50,969
Norway		16,779
Denmark	20,974	22,367
Germany	438,742	459,891
Holland	265,763	332,538
Belgium	114,157	132,326
France	125,550	127,327
Portugal, Azores and Madeira	7,972	7,331
Italy	117,181	109,032
Japan	.....	8,869
United States	35,745	44,904
Australasia	28,412	34,246
Canada	11,394	10,255
Other countries	61,107	50,445
Totals	1,380,342	1,428,549

There is little to be hoped for from the exports to Germany and Holland, which are found to decline rapidly, but in Belgium, France, and particularly in Italy, we ought to gain ground, since freights are less against us.

The exports of products classified as bar, angle, bolt and rod iron were as follows:

Exports of Bar, Angle, Bolt and Rod Iron.

	1899. Gross tons.	1900. Gross tons.
Russia	3,688	1,498
Sweden	5,000	99
Norway		2,820
Germany	4,601	2,512
Holland	3,110	2,381
Portugal, Azores and Madeira	8,811	6,072
Italy	1,029	470
Turkey	497	429
China (including Hong Kong)	9,021	7,408
Japan	4,529	17,012
United States	4,453	5,006
Chili	4,205	5,119
Brazil	5,582	3,626
Uruguay	2,545	2,667
Argentine Republic	7,163	11,461
British Possessions in South Africa	7,179	7,382
British East Indies	23,495	24,424
Australasia	40,430	36,366
Canada	3,944	1,331
Other countries	20,368	19,031
Totals	159,659	157,114

The largest customers of the British manufacturers in this branch are the English colonies, in which American manufacturers have already established relations.

The export tonnage of railroad material is exhibited in the following table:

Exports of Railroad Material of all Sorts.

		1899. Gross tons.	1900. Gross tons.
Russia		14,773	1,762
Sweden		76,823	34,952
Norway			5,455
Denmark		8,294	10,877
Germany		945	243
Spain and Canaries		4,573	5,827
Italy		1,652	86
Egypt		35,927	18,419
China (including Hong Kong)		15,963	7,160
Japan		3,799	11,616
United States		95	44
Cuba and Porto Rico		360	3,525
Mexico		17,673	15,003
Peru		749	3,580
Chili		8,324	2,741
Brazil		16,381	11,645
Uruguay		767	10,200
Argentine Republic		25,155	44,944
British Possessions in South Africa		23,720	38,421
British East Indies		157,801	105,393
Australasia		57,006	68,402
Canada		34,757	12,744
Other countries		85,130	50,921
Totals	Rails	471,774	373,744
	Chairs and sleepers	60,745	43,022
	Unenumerated	58,148	47,164
Totals		590,667	463,960

So far as the foreign rail trade is concerned, it is probable that for 1900 our figures will exceed those of our British rivals, and recent developments indicate that our rail makers are still capturing new orders in spite of the decline in prices abroad.

The British statistics do not give in detail the destination of the exports of wire and manufactures thereof. The only figures given are the total, which was 48,498 tons in 1899 and 38,488 tons in 1900.

This brings up a question which is not explicitly referred to in the English statistics, and that is to what extent the exports given are really nothing but transit shipments. Whether, in other words, a considerable part of the tonnage reported as exported is not really the product of other countries. The fact that in other lines in which Great Britain produces little, like copper and tin, its exports figure largely in the same tables leads to the belief that such is the case. It is well known that, for instance, in the wire trade, both the United States and Germany ship to distant countries via English ports.

The exports of hoops, sheets and boiler and armor plates were as follows:

Exports of Hoops, Sheets and Boiler and Armor Plates.

	1899. Gross tons.	1900. Gross tons.
Russia	5,962	1,680
Germany	1,556	844
Holland	543	343
Portugal, Azores and Madeira	6,915	5,602
Spain and Canaries	861	1,115
Italy	2,071	1,063
Roumania	5,976	1,892
Egypt	6,362	7,319
Japan	5,251	3,649
United States	1,273	392
Chili	1,426	1,885
Brazil	2,437	1,990
Argentine Republic	2,538	2,251
British East Indies	21,628	17,750
Australasia	11,037	12,804
Canada	14,195	6,741
Other countries	19,893	17,702
Totals	109,924	85,022

It will be observed that in this branch, too, the English colonies absorb a large share of the tonnage.

A very important business is done by British makers of galvanized sheets, which are widely distributed.

Exports of Galvanized Sheets.

	1899. Gross tons.	1900. Gross tons.
Germany	1,816	2,437
Holland	3,738	1,905
Portugal, Azores and Madeira	1,134	942
Spain and Canaries	1,112	1,350
Dutch Possessions in India	3,698	4,395
Philippine Islands	669	3,047
Foreign West Indies	5,183	2,630
Mexico	5,966	5,383
Central America	1,330	1,262
Chili	4,668	10,269
Brazil	3,469	2,602
Uruguay	3,667	2,719
Argentine Republic	24,222	22,506
British Possessions in South Africa	22,329	22,535
British East Indies	41,342	48,403
Australasia	59,983	65,991
Canada	4,549	3,627
British West India Islands and Guiana	3,290	1,904
Other countries	45,848	43,340
Totals	238,013	247,247

Aside from the English colonies the South American countries take large quantities of galvanized sheets.

The British export trade in tin plates has only incidental interest, but is given below:

Exports of Tin Plates.

	1899. Gross tons.	1900. Gross tons.
Russia	28,855	32,725
Germany	26,066	18,255
Holland	14,131	14,814
France	14,368	23,433
Portugal, Azores and Madeira	5,299	5,678
Italy	2,383	3,284
Roumania	4,633	2,424
United States	63,546	58,040
Brazil	5,408	4,439
Argentine Republic	3,766	4,717
British East Indies	13,923	22,590
Australasia	12,237	19,961
Canada	20,917	22,148
Other countries	40,841	41,447
Totals	256,373	273,955

The exports to the United States, of course, consist almost wholly of drawback plates.

The exports under the general clause of cast and wrought iron and all other manufactures unenumerated, except ordnance, are given in the following table:

Exports of Cast and Wrought Iron and All Other Manufactures Unenumerated, except Ordnance.

	1899. Gross tons.	1900. Gross tons.
Russia	7,416	3,747
Sweden	23,348	12,647
Norway		7,609
Denmark	10,967	9,539
Germany	10,248	9,063
Holland	13,652	16,029
France	3,880	5,534
Spain and Canaries	4,013	4,363
Italy	3,763	3,462
Japan	8,302	14,223
United States	2,087	2,047
Foreign West Indies	3,738	3,357
Peru	1,068	1,177
Chili	3,665	6,855
Brazil	14,407	8,934
Argentine Republic	23,443	15,809
British Possessions in South Africa	35,909	37,593
British East Indies	70,507	65,015
Australasia	51,993	54,642
Canada	4,229	1,841
British West India Islands and Guiana	4,697	4,879
Other countries	57,441	51,105
Totals	358,773	339,470

The exports of old iron and steel for remanufacture amounted to 115,726 tons in 1899 and 95,135 tons in 1900.

The exports of steel unwrought were as follows. To judge from the valuations this is largely, if not exclusively, crucible steel, the value averaging about $50 per ton:

Exports of Steel Unwrought.

	1899. Gross tons.	1900. Gross tons.
Russia	28,847	10,266
Sweden	20,686	3,619
Norway		20,114
Denmark	12,548	11,334
Germany	56,188	31,648
Holland	17,146	22,384
France	9,097	12,253
United States	16,700	17,603
British East Indies	29,230	31,014
Australasia	33,692	39,318
Canada	17,934	13,544
Other countries	87,237	96,299
Totals	329,309	308,396

In the case of the exports to the United States the value of 16,700 tons exported in 1899, for instance, was over £330,000.

The exports of black plate, for tinning were:

Exports of Black Plates for Tinning.

	1899. Gross tons.	1900. Gross tons.
Russia	32,418	19,395
Germany	14,206	13,373
United States	4,102	753
Other countries	35,003	32,237
Totals	85,729	65,758

The exports of manufactures of iron and steel combined were as follows:

Exports of Manufactures of Iron and Steel Combined.

	1899. Gross tons.	1900. Gross tons.
United States	467	361
Brazil	3,023	660
British Possessions in South Africa	2,253	3,334
British East Indies	20,155	15,421
Australasia	2,146	3,211
Other countries	16,123	19,276
Totals	44,167	42,263

The total tonnage of iron and steel is given as 3,717,180 tons in 1899 and 3,545,357 tons in 1900.

Machinery Export.

The exports of locomotives were as follows:

Exports of Locomotives.

	1899.	1900.
Russia	£10,138	£9,484
Germany	3,169	2,092
Belgium	14,475	6,877
France	9,046	31,942
Spain and Canaries	30,285	57,972
Other countries in Europe	135,452	160,906
United States	3,017	909
Countries in South America	182,689	228,744
British Possessions in South Africa	55,554	80,158
British East Indies	762,178	431,688
Australasia	98,888	206,298
Other countries	162,498	283,839
Totals	£1,467,389	£1,500,909

The exports of agricultural engines were as follows:

Exports of Agricultural Engines.

	1899.	1900.
Countries in Europe	£572,017	£564,764
United States	4,815	448
Countries in South America	52,710	66,256
British Possessions in South Africa	2,930	5,934
British East Indies	25,755	19,840
Australasia	28,656	26,353
Other countries	74,646	70,251
Totals	£761,529	£753,846

For steam engines we have the following figures:

Exports of Steam Engines.

	1899.	1900.
Russia	£232,968	£142,777
Germany	154,413	126,570
Belgium	34,409	35,832
France	68,121	75,918
Spain and Canaries	65,619	99,508
Other countries in Europe	226,265	309,247
United States	2,673	33,528
Countries in South America	111,992	112,169
British Possessions in South Africa	106,992	108,285
British East Indies	231,765	222,677
Australasia	122,991	247,352
Other countries	288,417	327,377
Totals	£1,646,625	£1,841,240

The exports of agricultural machinery were as follows:

Exports of Agricultural Machinery.

	1899.	1900.
Countries in Europe	£680,700	£663,607
United States	1,165	5,947
Countries in South America	99,703	108,455
British Possessions in South Africa	23,406	18,836
British East Indies	10,698	14,570
Australasia	72,670	71,687
Other countries	56,677	48,813
Totals	£945,019	£931,915

In sewing machines the exports were:

Exports of Sewing Machines.

	1899.	1900.
Countries in Europe	£1,126,417	£1,235,331
Countries in South America	51,370	51,575
British Possessions in South Africa	20,574	20,725
British East Indies	36,868	27,132
Australasia	7,645	9,030
Other countries	38,058	47,851
Totals	£1,280,932	£1,391,644

The decline in the exports of mining machinery is naturally largely due to the South African war:

Exports of Mining Machinery.

	1899.	1900.
Countries in Europe	£44,246	£67,766
United States	1,960	360
Countries in South America	43,019	35,047
British Possessions in South Africa	349,266	144,807
British East Indies	65,453	70,790
Australasia	121,154	149,498
Other countries	105,720	93,833
Totals	£730,818	£562,101

Textile machinery is the only branch in which Great Britain still holds a strong position in this country. It will be noted in the following table that there has been a heavy increase in 1900:

Exports of Textile Machinery.

	1899.	1900.
Russia	£1,682,599	£1,056,257
Germany	906,901	865,370
Holland	197,544	211,758
France	540,623	779,368
Other countries in Europe	1,111,147	1,282,967
China (including Hong Kong)	190,286	27,159
Japan	95,978	144,346
United States	365,424	648,639
Countries in South America	122,615	129,986
British Possessions in South Africa	12,695	11,099
British East Indies	1,051,466	658,566
Australasia	20,756	17,566
Other countries	505,914	378,837
Totals	£6,803,948	£6,211,918

The exports of general machinery were as follows:

Exports of Machinery Not Above Enumerated.

	1899.	1900.
Countries in Europe	£3,213,836	£3,086,648
United States	80,336	108,459
Countries in South America	421,981	411,233
British Possessions in South Africa	241,325	211,715
British East Indies	699,710	783,538
Australasia	503,249	697,367
Other countries	856,419	1,129,024
Totals	£6,016,856	£6,427,984

The total value of machinery and mill work exported from Great Britain was £19,653,116 in 1899 and £19,621,557 in 1900, or say $95,000,000.

Reduced Freights on Ore and Coke.—A joint meeting of the Central Freight Association and the Trunk Line Freight Association will be held within a few days to fix rates on coke between Connellsville and the Shenango Valley, and Connellsville and Pittsburgh, and on ore from lower lake points to the Valleys and Pittsburgh. The present rate on coke between Connellsville and Mahoning and Shenango Valleys is $1.20 a ton, and it is probable this will be reduced to $1.10 or $1.05 a ton. The rate on coke between Connellsville and Pittsburgh is 70 cents, and it may be reduced to 60 cents. The present rate on ore between the lakes and Pittsburgh is $1.05 a ton, and this may be reduced to 90 cents.

A New Principle in Gas Engine Design.*

BY C. E. SARGENT, CHICAGO, ILL.

While the gas engine has become such an important prime mover that it is looked upon and is to-day a most formidable rival of the steam engine, it has certain disadvantages as a power generator which are not only recognized by its devotees and manufacturers, but are considered inherent and beyond elimination by many of those who have given the internal combustion engine a great amount of study. To overcome these disadvantages, eradicate the defects, improve the efficiency and design an engine which would meet the requirements of prime movers, and one that would not only be simple and cheap to construct, but one which could be easily manipulated and controlled by the average engineer, has been the object of the author, and the result the subject of this paper.

The author then considers the shortcomings of the modern gas engine of the four-cycle type, after which he describes his engine as follows:

In general it is a horizontal center crank, self contained engine, the main frame of which rests on a sub-base (which could be replaced by masonry if desired), sufficiently high so that the wheels clear the floor line.

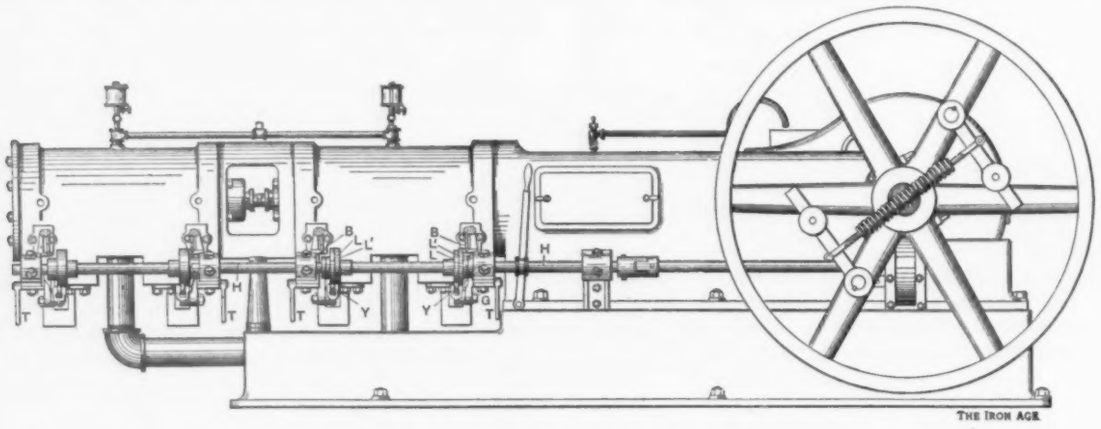


Fig. 1.—Side Elevation of Governor Side of Engine.

A NEW PRINCIPLE IN GAS ENGINE DESIGN.

The frame is of the self oiling inclosed type, keeping the oil in and the dust out, with bored guides and side doors, giving access to cross head and stuffing box. The cylinders are made with one head cast in and a valve chest on the bottom of each end. The crank end cylinder is centered in and bolted to the frame. To the head of this cylinder is bolted the distance piece which makes a cylinder head, and to which is centered and bolted the head end cylinder. A pedestal under the distance head to the sub-base, or foundation, prevents the cylinders from sagging, yet allows linear expansion, so necessary in a heat engine. The air for each cylinder is taken from outside of the engine room or from the perforated extension of the sub-base, Figs. 1 and 3, which deadens the noise of suction while the exhausts from the cylinders are connected together, Fig. 2, and run where desired. No muffler or exhaust head is used. Each cylinder is water jacketed, and the water surrounds each piston rod, stuffing box and valve chest. Water enters at the bottom center of each cylinder and passes out the center and top through the same opening in outer shell as the cylinder oil passes in, as shown in Fig. 2. Provision is made for a thermometer at the water outlet of cylinders, and in the exhaust gases before leaving the cylinder, as shown in half tones. Each combustion chamber (clearance space) has one port in the bottom, both for admission and exhaust, Fig. 2, and one vertical poppet check valve, which is held to its seat during compression and inflammation by the internal pressure. There is also a vertical piston valve, R, in each valve chest, Figs. 2 and 3, which opens and closes the exhaust ports and air and gas ports at the proper time.

The side shaft H, Fig. 1, and in section Fig. 3, is driven by worm gears of the same diameter, Fig. 4, at one-half the speed of crank shaft, as in ordinary four-cycle engines. The valve cams and igniters, one for each explosion chamber, are keyed to this shaft 90 degrees apart, so that one end of one cylinder is always giving an impulse stroke, while the three other ends are exhausting, compressing or drawing in a fresh charge respectively. As all valve chests and connections are duplicates, a description of the operation of one will suffice.

In Fig. 3 X is a lever, one end of which is forked around collar nuts screwed to the stem of the piston valve R, by which this valve is controlled; Y the roller, carried by the other end of lever, which is held against the cam M K by the spiral spring Z. As the piston in the cylinder makes four strokes every time the cam M K makes one rotation, this cam must perform all operations while going once around. That part of the cam, N I K L, being a circle causes no action of the piston valve and is called the normal part of the cam. When the point I is in contact with the roller Y the pistoon is at the end of the suction stroke. When the part I K passes the roller Y, one-quarter of the cam shaft rotation, the piston has moved through one stroke while the compression has gone up. When K is at the roller Y the cam G has just passed under the igniter rod B, causing a contact and break between the electrodes at A, igniting the charge, and by the time L reaches the roller the piston has made the working stroke, and here that part of the cam L M pushes the roller end of the level down while the other end goes up, carrying the piston and poppet valve until it is in position shown at E *x*, Fig. 2, for one stroke, during which exhaust takes place. When the piston is at the end of the exhaust stroke and M is at Y, the cam has allowed the roller to return to its normal position, as shown in Fig. 3, and at C *o*, where compression is taking place, and W *o*, the working stroke, Fig. 2, closing the exhaust port and allowing the poppet to seat; but as the depressed part of the cam M N passes the roller the spring Z drives the roller up into the depression, while the piston valve goes down, until the air and gas ports register, when gas and air, in the right proportion, are drawn in. To the lower end of the poppet valve stem, which passes through the piston valve stem, is attached a small piston, W, working in the cylinder V of a dash-pot piston C, which moves with the piston valve. Now, as the piston valve descends by the action of the spring Z from the position of exhaust shown at E *x*, Fig. 2, to the position of induction, I *n*, the air in U, being compressed by the downward movement of the dash pot C, forces up W, raising the poppet valve P again, which is seated for an instant when the piston valve passed its normal position, passing from exhaust to admission, thus holding open the poppet valve, as shown at I *n*, while air and gas are admitted to the cylinder. When the

*Abstract of paper presented at the New York meeting of the American Society of Mechanical Engineers.

piston has made one-half a stroke the part of the cam N reaches the roller, depresses it and raises the piston valve to its normal position, as shown in Fig. 3, cutting off both gas and air and allowing rarefaction to take place, when the cycle is repeated. After cut off takes place the poppet may remain open until the return stroke begins to allow the mixture in the valve chest and cylinder to have equal tension; but from cut off to exhaust opening, one and one-quarter rotations of the crank shaft, the piston valve remains in its normal position, closing both inlet and exhaust ports. The gas port D and air port E, Fig. 3, are separated by a web, Fig. 5, which is a horizontal section through air and gas ports, so that when the piston valve is in its normal position and these ports through the bushing are covered, gas is shut off from the air. When induction takes place the port F in the piston valve registers with the air port E (see position of valves at cylinder port I *n*, Fig. 2), and the gas port D, shown only in Fig. 3. The port F does not run entirely around the piston valve, but is left solid at S, Figs. 3 and 5, which is just the right width to cover the entire gas port, if desired, when the port F registers with the air and gas ports E and D. By moving the lever O from the crank shaft this piston valve is rotated and the part S uncovers the gas port and covers the air port, so that any possible proportion of gas and air may be obtained without in any way reducing the area of the inlet ports. The guide carrying the lever O is graduated so that the operator can always tell what proportion of gas and air is being used. With blast furnace or producer gas the gas port might have to be as large as the air port, which is easily accomplished. The electric igniter, Fig. 3, is so placed in the cylinder that a mixture free from exhaust always surrounds it, insuring proper ignition of the fresh charge, even at atmospheric pressure.

As each end of each cylinder is a complete engine of itself, having a separate air, exhaust pipe and igniter, any one or all of the explosion chambers may be used for producing the power required. By cutting off the gas from any explosive chamber it ceases doing work; yet compression may take place therein, storing up the inertia of the reciprocating parts. By moving the lever T, Figs. 1 and 3, to a horizontal position its exhaust valve is held open and the cylinder may be examined or the igniter removed without stopping the engine. These levers are also used to hold the exhaust valves of the head end cylinder open when starting with the crank end cylinder, thus removing all compression. As the ports and valves are on the bottom any surplus oil in the cylinder will be carried down and will lubricate the piston valves and stems. The crank shaft, cross head pin, crank pin, guides and worm gears are lubricated in the following manner:

The worm gears are arranged to run in a tight fitting case, one-half of which is made in the engine frame by babbitting around the blank before teeth are cut, Fig. 4. The oil from the basin under the crank shaft flows into the gear case and is carried up by the spaces between the teeth, but, prevented from passing around by the teeth from the other gear, is forced through a system of pipes to the different sight feed oilers, as shown in the drawings. What oil is not used by the sight feed oilers is by passed through the goose neck high enough to give the oilers sufficient head and flows through the strainer on crank case hood back into crank case basin. The crank pin and cross head pin are oiled by the overflow from the main bearings and the upper slipper in the usual manner. The design of the frame is such that all oil flows by gravity back to the settling chamber in the crank case basin; yet the crank and counter weights do not dip into the oil, so the working parts are as clean as if they were not inclosed.

The cylinder oilers are of a special design that feed only when the engine is running, stop when the engine stops, yet the feed is always in sight; the quantity in the glass reservoir may always be seen, no pressure or smoke enter the bull's-eye of the reservoir, and the latter may be filled any time without shutting off the needle valve, thus changing the adjustment. From six to 15 small drops per minute are found to be sufficient for a cylinder and its valves. The governor, Fig. 1, consists of two weighted inertia levers held toward the center of governor pulley by one helical spring on a diametrical line with a right and left nut in each end, so that the tension may be adjusted by turning the spring. The governor arms are keyed to shafts, which extend through a bushed boss on diametrically opposite spokes, Fig. 4, and these shafts have radial arms, the ends of which connect by links to the driving gear, which is otherwise loose on the crank shaft. When the speed goes beyond normal the weighted arms separate and the driving gear, as well as the driven gear, advance in time ahead of the crank shaft. This makes the cut off earlier and less gas and air are admitted to the cylinder; consequently the speed is controlled. If the time of the side shaft advances ahead of the crank shaft, not only will the cut off be earlier but the time of every other operation controlled by the cams on this shaft will be advanced. The exhaust will open before the end of the stroke and will close before it, but as the poppet cannot open until the pressure within the cylinder is reduced to atmosphere the admission begins later and cuts off earlier when engine is cutting off, so that should the governor advance the side shaft 45 degrees, or until the cut off at one-quarter of the stroke, then the exhaust would close at three-quarters of the stroke and no fresh charge would be admitted to the cylinder; and the lowest possible compression, should the admission be entirely cut off, is one-half of the maximum at full load. As the fresh charge becomes more diluted with the exhaust product it becomes a slower burning mixture, and the time of ignition should be earlier, for which the advance of the cam shaft provides.

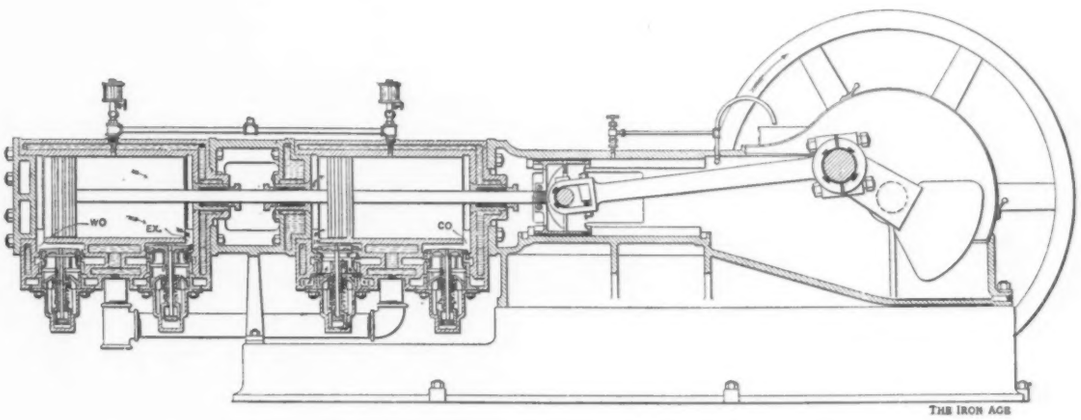


Fig. 2.—Vertical Section through 75 Horse-Power Engine.

A NEW PRINCIPLE IN GAS ENGINE DESIGN.

Starting Mechanism.

If the size of the engine is such that the attendant can turn the fly wheels by hand it is started as follows:

The vertical lever just in front of the crank end cylinder, Fig. 1, contains a pin and roller which run in the grooved collar on the cam shaft, and by moving this lever from the crank shaft the cam shaft H is moved longitudinally when the starting cams L' of the crank end cylinder engage with the rollers Y, and a double igniter cam comes under each igniter rod B. This double igniter cam produces two ignitions at each end of the cylinder for each revolution of cam shaft immediately after cut offs take place.

Fig. 6 is an end view of the cam L', which admits and exhausts twice during each revolution of the cam shaft. As soon as the engine has sufficient speed to compress a regular charge the vertical lever is either moved toward the crank, throwing the regular igniters and cams L into operation, or one end of the other cylinder is started by throwing from a horizontal to a vertical position the lever T. When the cams L' engage with the rollers Y the crank end cylinder could be used for a steam or compressed air motor, having a fixed cut off at half stroke, so if it were not found practicable in very large engines to start by turning the fly wheels compressed air could be used to get up sufficient momentum to start the head end cylinder.

As the mean effective pressure of the starting diagrams is only about 6 pounds the engine should start without load with from 8 to 10 pounds air pressure, which is about one-fifteenth the pressure used for starting engines in which the regular compression must be overcome. Should circumstances arise in which it would be desirable to start the engine with full load, as in locomotive practice, then compressed air could be used in both cylinders with any predetermined pressure until the maximum speed is obtained, when, by simply moving the lever and opening the gas valve, it is immediately converted into an internal combustion engine with a noiseless exhaust.

General Conclusions.

As the mean effective pressure of an engine utilizing only about one-half a cylinder full of combustible mixture is about 60 per cent. of that of the ordinary gas engine, the cylinder capacity of an engine maintaining a higher efficiency by greater expansion must be nearly twice the capacity of the ordinary gas engine cylinder for the same power developed; yet the same could be said of a steam engine utilizing the expansion of the steam compared to one without cut off. However, as but one crank and lighter fly wheels and double acting cylinders can be used it is probable that an engine of this type would not weigh more for the same output than the ordinary single acting engines now on the market.

One of the disadvantages of the modern internal combustion engine advanced when comparing this type of motor with the steam engine is that it cannot be overloaded, and that its range of economy is greatly restricted. If a motor is giving out its full power and more is added the motor will stop, as there can be no reserve when each induction stroke takes a cylinder full of explosive mixture. On the other hand the engine must not run below its rated capacity or the efficiency will be greatly impaired. In other words, the economical range of the modern gas engine is at full load, for reasons heretofore pointed out. But if, instead of taking a cylinder full of combustible mixture as our unit of fresh charge, we design the engine so that two-fifths or thereabouts of a cylinder full of combustible mixture is sufficient for the average load, with the principle of utilizing the charge and governing pointed out we will have a much greater range in which the engine may be worked without an appreciable loss in efficiency.

As the compression changes only one-half as fast as the cut off with a change of load we can have a reserve of power even if we do release considerably above atmospheric pressure, so long as compression does not go sufficiently high to cause premature ignition. Of course loading such an engine beyond its normal capacity may even lower the efficiency, as in a steam engine, but sometimes the ability to carry an overload for a short time far outweighs the necessary loss.

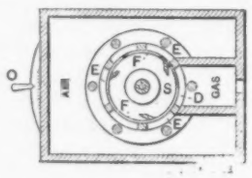


Fig. 5.—Sectional Plan through Air and Gas Ports.

Fig. 6.—Cam.

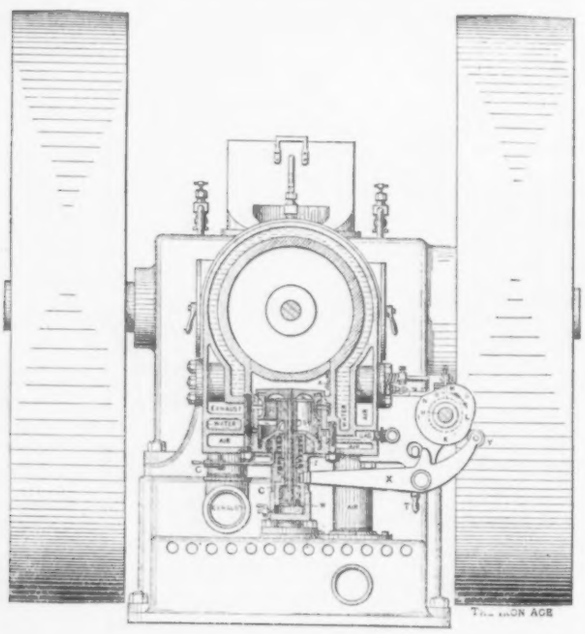


Fig. 3.—Vertical Cross Section through Crank End Valve of the Head End Cylinder.

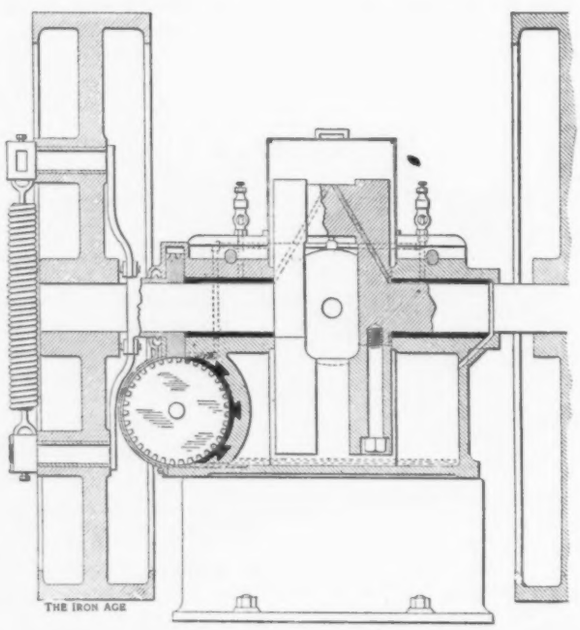


Fig. 4.—Vertical Cross Section through the Crank Shaft, Looking Toward the Cylinder.

A NEW PRINCIPLE IN GAS ENGINE DESIGN.

The method of retaining the products of combustion to reduce the clearance and thereby raise the compression during light loads may be considered inadvisable by some authorities, yet others show by experiments that the inert gas has no injurious effect on the incoming charge except possibly to make it a slower burning mixture, which, on account of our method of ignition, has no deleterious effect. With a fixed point of ignition and a slower inflammation as the load decreases, a limit to the piston speed is reached and is given by some authors as 600 per minute. Yet it is evident that the quicker we can expand the gases the more heat will be turned into work, and the less will be transmitted to the cylinder walls; therefore, if we can advance the time of ignition so that the maximum pressure takes effect at the beginning of the stroke the piston speed may be materially increased and the jacket losses minimized.

While no exhaustive tests have been made to determine the actual thermal efficiency of the engine under different conditions and loads, a comparison of the amount of gas used per brake horse-power with that of the ordinary gas engine shows a considerably higher efficiency, and the author hopes the results of an actual test may be presented to the society at its next meeting.

From a mechanical standpoint very little improvement could be desired. The 10¼ x 19 inch engine which developed 50 horse-power with illuminating gas, running at a piston speed of 700 feet per minute either light or loaded, produced no perceptible vibration, though it was not anchored to the foundation, but merely rested on the wooden wedges used for leveling up the engine.

As the cams and rollers are always in contact no noise arises from the cams striking the rollers, and though the poppet valves are inclined to rattle when seating a proper adjustment of the air pressure by the pet cock in the dash pot guide will almost entirely overcome the noise.

The worm gears necessary for driving the cam shaft must run in oil to be efficient, and in doing so are noiseless and make an ideal pump for circulating the oil to the engine bearings.

While the length of the engine is considerable it is no more than that of tandem compound steam engines of the same stroke, and the hight is such that no ladders or galleries are necessary for indicating or making accessible the working parts. The engine is fitted with a permanent reducing motion of such a design that pressing a spring starts the indicator drum and pulling a string stops it. No oil is thrown from the moving parts and the working parts are not exposed to the evil effects of dust and dirt.

English Imports of American Pig Iron and Steel.—During the year 1900 the following quantities of pig iron and "unwrought steel" were imported into Great Britain, monthly:

	Pig iron		Unwrought steel.	
	Quantity.	Value.	Quantity.	Value.
1900.	Tons.	£	Tons.	£
January	5,742	22,898	409	3,988
February	2,356	8,905	369	5,190
March	4,688	18,101	585	4,991
April	1,853	7,544	2,632	18,955
May	1,629	5,154	2,190	17,684
June	4,829	14,783	14,988	109,034
July	3,121	13,022	10,200	67,108
August	7,282	31,140	11,883	84,663
September	8,829	33,087	21,538	142,796
October	11,041	45,175	31,217	181,591
November	28,759	99,484	32,643	198,925
December	14,153	50,456	28,974	176,926
Total, 1900	94,282	350,649	157,628	1,011,851

We do not know whether "unwrought steel" includes sheet and tin plate bars.

A New Tube Plant.—C. E. Corbett of Pittsburgh, formerly connected with the Pennsylvania Tube Works, in that city, in connection with some Pittsburgh and Eastern capitalists, have organized the Eastern Tube Company, with a capital of $1,000,000. The concern propose to build a plant at Zanesville, Ohio, for the manufacture of tubes, capitalists of that place having subscribed for stock to the extent of $150,000. Wm. M. Carr, president of the Board of Trade of Zanesville, was in Pittsburgh last week, and it is said final arrangements were made for the financing of the company. It is stated that the plant will be completed by June, and will have a daily capacity of about 400 tons. The product will include lap and butt weld pipe for gas, water and oil lines and tubular goods in general.

The Situation in the Iron Trade of Europe.

BY J. STEPHEN JEANS.

It would be difficult to imagine a greater contrast than that which is presented by the condition of the iron trade of Europe to-day with that of a year ago. The prevailing tone in the early part of 1899 was one of great buoyancy and confidence; at the beginning of 1900 the confidence had been somewhat chastened, and the outlook was a little less clear, but yet there were no evidences of despondency, still less of despair. At the beginning of 1901 the tone is entirely the reverse of what it had been 12 months previously. Prices have fallen largely and rapidly, and a much more considerable collapse is generally anticipated in the future. The make of British pig iron has been reduced by the blowing out of between 55 and 60 blast furnaces, which really means a diminished rate of production at the rate of about 1,500,000 tons of pig iron per annum. The demand for ship plates, which is the largest single branch of finished material produced in Great Britain, has fallen very materially, and prices are following in the same direction, although as yet the drop of prices is not very serious. The big iron makers, both in Scotland and in the Cleveland district, are stated to be unable to produce iron at a profit with the present costs of raw material, and as regards those who have to buy coal, coke and iron ores in the open market, this, no doubt, is the case.

But the most remarkable change of all has overtaken the coke trade. A year ago coke was almost at famine prices, and there were apprehensions lest the supply should prove vastly unequal to the demand. Prices were consequently forced up to a figure that had only once before been known—namely, in the darkest days of the coal famine of 1873. To-day there are very few coke manufacturers in Great Britain, and probably only half a dozen at the most in Germany and Belgium, that are able to keep their plants fully employed. Many hundreds of ovens have been discontinued, and all at once it looks as if the trade had suffered a complete collapse. For this there are many obvious reasons, but the most important are, of course, the reduction of the make of pig iron, which has liberated probably 30,000 tons of coke per week, and the strenuous competition of Germany in Baltic countries, founded, somewhat strangely, to a material extent on the importation of small coking coal from the North of England into Germany, where such coal is worked up into coke in by-product ovens and sold at a profit against coke imported into Scandanavian countries direct from the North of England.

The extent to which the condition of prices and demand has already suffered may be estimated by the figures that follow. The differences of prices between the present time and the middle of the year can be traced in Table I:

Prices at the Middle and the End of 1900 *in British Markets, Per Ton.*

	s. d.	s.
Coke at ovens (Durham)	26	17
Iron ore (Bilbao)	21	18
Scotch warrants	68	60
Cleveland warrants	70	50
Hematite warrants	84	62
No. 3 foundry	65	50
Common bars	200	160
Steel rails	140	120
Ship plates	160	135
Tin plates, IC cokes, per box	15 6	13

Now it is obvious that the main trouble that worries the iron trade of Great Britain at the present time is that of producing iron and steel at a profit under existing conditions of prices and wages. Taking hematite warrants as a case in point, the costs of six months

ago will probably compare as under with the costs now within a comparatively narrow margin of error:

Cost Per Ton of Hematite Pig Iron.

	January, 1901.	June, 1900.
	s. d.	s. d.
Coke	16 6	25 0
Iron ore (Bilbao)	36 0	42 0
Labor	2 6	2 6
Flux and incidentals	5 0	5 0
Totals	60 0	74 6

Here we find a reduced cost of about 14 shillings 6 pence per ton, but the difference of selling price is 22 shillings per ton, so that the pig iron maker is netting about 8 shillings per ton less than he was about six months ago.

It cannot be said that the year 1900 has, on the whole, been unsatisfactory for those who are engaged in either the iron or the steel trade. On the contrary, from the point of view of realized prices, it has probably been one of the best years we have ever known, and it is emphatically the best year in respect of total realized value. Much, if not the most, of the total difference has, however, found its way into the pockets of the "hewers of wood and drawers of water"—in other words, those who supply the raw materials. Pig iron makers, as such, and manufacturers of plates, rails, tin plates, sheets and other finished commodities, as such, have by no means been doing so well as the nominal values of their products would seem to indicate. This is fully proved by the many reports that have been published of limited liability companies, who have practically to buy the whole of their raw materials in the open market. Speaking generally, such firms may have done better than the normal by about 10 per cent., but raw materials have done better by 25 to 75 per cent.

An analysis of the returns of British exports shows that the volume of business fell off largely and rapidly toward the close of the year 1900, so that if the results of our foreign trade for the first six months are compared with those for the second six months, the difference is very much against the later period. The monthly shipments of tin plates varied from about 28,000 to 19,000 tons; of blooms and billets from 35,000 to 16,000 tons; of merchant iron and steel from 16,000 to 9000 tons, and of galvanized sheets from 26,000 to 16,000 tons. The maximum exports, those of April, were over 362,000 tons, while the minimum exports, those of December, were only 209,000 tons.

The prospects of the immediate future are generally regarded as unsatisfactory from an exporter's point of view, because would be buyers are for the most part playing a waiting game, and there is not so good an outlook in respect of Chinese and South African markets as was generally hoped for a few months ago.

There can be no doubt that the greatest bugbear of British trade, and, indeed, of the trade of all the countries of Continental Europe, so far as the immediate future is concerned, is American competition. During the earlier part of the year 1900 this was very little felt. In the latter part of that year foreign iron has been much more in evidence. In proof of this it is only necessary to state that for the first four months of 1900 only 176,000 tons of iron and steel of all kinds were imported into Great Britain, whereas in the last four months of the year the imports were not less than 368,000 tons, or more than twice as much. The total imports of iron and steel into Great Britain for the 12 months have amounted to 761,402 tons, against 645,019 tons in the year 1899 and 591,425 tons in the year 1898. The value of the iron and steel imports of Great Britain in 1900 is as much again as that of the imports of three years previously.

The pinch is most keenly felt in the steel trade. In the first four months of 1900 Great Britain imported only about 10,000 tons of what is catalogued in the British returns as unwrought steel, meaning blooms and billets. In the last four months of the year the corresponding imports were about 125,000 tons. Practically the whole of this great quantity was received from the United States, which, in the latter part of the year, began to ship on a large scale, in fulfillment of orders made at an earlier period, when the reduced American demand had thrown on the hands of American manufacturers a considerable surplus, which Europe was eager to acquire at the price. Now if this surplus had been a few thousand tons only it probably would have affected prices very little, if at all. But when it assumes such large dimensions as it is now doing it practically fixes and controls prices, and British manufacturers, if they are to get the business or any large part of it, must shape their prices accordingly.

From the European standard this is the most serious feature of the whole situation. British manufacturers would not by any means despair at the prospect of seeing American manufacturers take a few thousand tons of steel rails or billets in international competition, but when it comes to be a matter of letting them take nearly all, or, as an alternative, come down to American prices, the outlook is much more serious. What is to be the end of it all? Nearly 20 years ago the steel rail manufacturers got over the difficulty of price competition by pooling all contracts with Belgian and German manufacturers in allotted proportions, and for a considerable time this answered the purpose pretty well; but in the long run quarrels arose as to allotments, and the organization was broken up. Is a similar organization possible or likely in view of the present conditions of international competition, and, if not, what is to take its place?

It is doubtful whether there ever was a time when the future of the iron trade of Europe was more at sixes and sevens than it is to-day. Everything seems to be, or to tend, in the direction of being topsy-turvy. The things that were least expected and looked least likely to happen three or four years ago are the very things that are actually happening to-day. Then Great Britain was practically the only country that produced and exported steel ship plates on a large scale. To-day both the United States and Germany have entered this field and are competing with Great Britain in British markets. Then it looked almost impossible to dislodge the United Kingdom from her supremacy in the export of railway iron and steel, whereas to-day the United States are exporting nearly as much material of this kind as Great Britain, and in a year or two more are likely to get ahead of Great Britain as a rail exporting country. Then Germany did the bulk of the export business in wire and wire rods, whereas American manufacturers now appear likely to get ahead of Germany, and have certainly made extraordinary advances within the past year or two. Then it looked as if Great Britain could at any length, for an indefinite period, provide herself with what the Germans call half manufactured material, in the form of blooms and billets, whereas to-day many thousands of tons of such materials are being shipped to British and other markets from the United States. Then it looked extremely doubtful whether the United States would be able to hold their own as a tin plate producing country, whereas no doubt is now expressed on this matter. It appears to be generally admitted that American manufacturers, who are already beginning to export tin plates, will give South Wales manufacturers a "warm time" in the markets of Europe and the Far East. German or American corrugated and galvanized sheets, again, would have almost been laughed to scorn in Great Britain only a few years ago, whereas they are now a really important factor in the world's supplies of manufactured material.

E. M. McIlvain, vice-president of the Bethlehem Steel Company of South Bethlehem, Pa., writes us: "It having been brought to our attention that a concern styling itself the Edison-Holzer Steel & Iron Process Company have been using the name of the Bethlehem Steel Company in a letter issued by them in which they ask for subscriptions to the stock of their company, we beg to state this company have no connection whatever with the Edison-Holzer Steel & Iron Process Company, nor do we in any way indorse the merits claimed by them for their process for treating steel."

The Iron Age

New York, Thursday, January 24, 1901.

DAVID WILLIAMS COMPANY, - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - BUSINESS MANAGER.

The Iron Age Index.

The Index to the reading matter of Volume LXVI of *The Iron Age*, for July 1 to January 1, 1901, is now from the press, and will be mailed to those subscribers of *The Iron Age* who will make application for it.

In order to relieve those who bind or file *The Iron Age* of the trouble of future applications for the semiannual Index, we shall prepare a special list to whom in the future the Index will be forwarded without further notice.

Fluctuations in the Prices of Iron and Steel.

Since graphic presentation is the most effective method of conveying at a glance fluctuations in values, we have compiled the diagram which we publish as a supplement. In order to permit of a ready means for comparing the prices of raw materials and of finished iron and steel we have converted those prices which are usually quoted in cents per pound into their equivalent of dollars per gross ton. As a matter of record, however, we print marginal tables showing the series of monthly average prices upon which our diagram is based.

The record speaks for itself. It shows the sharp decline of 1893 and 1894, the temporary recovery of 1895 and 1896, the low figures of 1897 and 1898, the boom of 1899, the sudden drop of the spring of 1900, and the moderate recovery of the fall of last year.

It is probably well to utter a word of warning as to the bearing of comparisons of prices. Generally speaking, they exaggerate the fluctuations. Usually, on a rising market, the great volume of business is done soon after the turn, while the quantities of goods sold at the high prices is generally small, and even they are subject to readjustment when a rapid decline subsequently develops.

Pools and syndicates very often give their customers warning of an advance, so that the greater part of the business is closed at the lower figure. Then, too, the periodic wars between members of associations lead to the booking of large orders at very low prices, which it takes many months and sometimes years to clear away. A good illustration is furnished by the rupture of the rail pool in 1897 when an enormous tonnage was placed at figures netting somewhere between $16 and $18, at mill. Besides, the apparent steadiness of prices during the life of associations is often deceptive, because while the quotations may remain uniform, there are secret concessions in many forms which lead to a net lower level.

If it were possible to obtain the average net monthly prices actually received by all the manufacturers in a certain line of goods, the curves representing actual prices would be much flatter than those represented by average quotations.

The ideal diagram would be one in which the thickness of the line represented in a plain manner the volume of monthly sales, the position showing the price. This would probably show clearly how the peaks taper away and how after all they are relatively unimportant.

The line representing profits, however, would certainly be the most eccentric, and illustrate the axiom that in the iron trade it is either feast or famine.

"The Steel War."

The steel trade has had the misfortune to attract the attention of the sensational daily press and of the stock jobbers in Wall street, a fact with which the industry must learn to deal as a natural outcome of the floating of so many public companies. It would be idle to deny that this is a factor with which those engaged in the business must reckon to some extent. A good many people utterly ignorant of the industry have become partners in iron enterprises either as temporary holders of stock or as investors in steel securities. They can be worked upon and are influenced greatly by newspaper reports and brokers' tattle. Nor is it wise to blink at the fact that Wall street quotations on steel stocks do exert an influence on the iron trade proper.

Every one knows that a certain discount must be applied to every statement which appears in the daily press. Generally speaking, the majority of readers do not make it large enough. The difficulty is to discover whether there is a grain of truth in the mass of rubbish of conjecture and of gossip.

We have had an extraordinary outburst lately, in flaming headlines, about the "Steel War," from which one would infer that the industry is on the eve of the great battle between the giants which every one familiar with the industry expects to occur at some time.

It was not long after the great consolidations were formed that two tendencies developed which gave promise of very active competition against them, these tendencies being fully discussed in the columns of *The Iron Age*. The first was the creation of new works, some of which were built with the deliberate purpose of being sold out to the particular consolidation at which they were aimed. Until now no punishment has been inflicted upon any of these "strikers," while some of the new plants have already been bought up. The second grew out of the fact that the large new concerns determined to go back to the raw material, so as to control their own sources of supply. That was a policy long pursued as to ore by the Illinois Steel Company, as to fuel by the Carnegie and other concerns in Pittsburgh, and as to both coal and ore by the Cambria Steel Company and Jones & Laughlins. Subsequently through the influence of H. W. Oliver the Carnegie Steel Company began their campaign for the control of lake ore properties. In the East the Pennsylvania and Maryland companies had years since turned to Cuba, while the Lackawanna Company rested upon the supply of the famous Cornwall ore hills.

When the era of consolidations came, the Federal Steel Company needed only, for rounding up, the purchase of coal property. The National Steel Company and one of the affiliated concerns, the American Steel Hoop Company, acquired important ore mines at the time of their organization and strengthened their position by developing coal lands. The American Steel & Wire Company have taken a similar course, and the Republic Iron & Steel Company have also become miners of lake ore. One notable exception has been the National Tube Company, who did not even acquire the important ore property controlled by some of the directors of one of the constituent companies.

Another development, of more potent direct influence

in shaping the relations between the great producers and incidentally in leading to an expansion of productive capacity, was the desire to control the intermediate materials, so as to become independent of outside supplies. This led to the building of blast furnaces, which we may note incidentally threatened the existence of the individual outside pig iron producers, and to the enlargement and construction of steel works. The latter emphasized a condition which had developed through the very act of consolidation. The rolling mills, the consumers of billets and bars, by alliance with steel works were withdrawn from the open market, and those were robbed of their old time customers who had formerly supplied them. Thus the old American Steel & Wire Company, once the largest purchasers of billets in the market, supplied from their own plants a large proportion of their steel and were working toward complete independence. It was only the danger of inviting competition in their own finished products, which led the concern to renew their large contracts for wire rods with the Illinois Steel Company. The National Steel Company gathered in practically all the tonnage of tin plates, sheets, hoops and a large share of the bars in the Central West by their identity of interest with the American Tin Plate Company, the American Steel Hoop Company and the American Sheet Steel Company. Relatively the smallest proportion of their own requirements of steel is produced by the National Tube Company, and here, too, the starting of a new open hearth plant in the Wheeling district showed a disposition to reach independence. Special circumstances, which recent developments illustrate, led to a suspension of this work. The more recently formed Crucible Steel Company of America has apparently determined to carry out the plan initiated before consolidation by one of the constituent companies of building a large open hearth steel plant.

It was very early in the history of the consolidations that arrangements were made to adjust matters in such lines of finished goods in which they overlapped. There are a number of cases in which subsidies have been paid by one consolidation to the other to keep out of its field.

Then there are other movements which have complicated the situation. Conspicuous among them is the transfer of the Lackawanna Iron & Steel Company from Scranton, Pa., to Buffalo, where a very much larger plant will be erected, a part of whose product must find other outlets than rails. Finally we have the expansion of older works, which are now financing for extensive improvements, conspicuous among which are the Pennsylvania Steel Company and the Cambria Steel Company, and, according to unconfirmed reports, the Federal Steel Company. As a last possible influence there are the new projects still in embryo, like the large undertaking in the vicinity of Fairport.

That, of course, reveals a somewhat complicated situation, and may explain to some extent the position taken by the Carnegie Steel Company when the determination is expressed that henceforth there can only be one profit from the ore to the finished material. The situation has not come upon the iron trade in the nature of a surprise. It has been understood for a long time, and has only become more impressive as month after month has added new developments tending in the same direction.

As for the building of the tube plant at Conneaut, the trade continues in a skeptical condition. The plan of manufacturing steel there from the ore up, using cheaply hauled fuel, looks sound and logical. Its utilization for producing tubes is accepted with reserve, since it may be aimed as an offset against a large, new structural plant at South Chicago. It is not probably generally understood in the steel trade that the material required for the steel pipe of the largest consuming interest is now made by the Carnegie Steel Company, the National Tube Company converting it into the finished article. This accounts for upward of 10,000 tons per annum, and it is not likely that the principle of purchasing the steel by the pipe consumer is likely to be abandoned readily.

That the general situation as outlined will become serious, ultimately, unless there is a heavy consumption, at home and abroad, cannot be denied, but it is a very different matter to create the impression that the immediate future is imperiled. As a matter of fact, many of the new undertakings and enlargements referred to cannot be completed under a whole year, and many will not come into play until far into 1902. Nor is it sure that even when that time occurs there will be the great battle of the giants which is pictured so vividly and is discounted so heavily.

It must not be forgotten that much of the plant which is now being built and projected is really intended to supplant older equipment no longer efficient. It must not be forgotten that many small individual works will be forced out of existence. Nor is it certain that a reckless warfare will be inaugurated, in which all must be frightful sufferers. The large interests have shown a disposition thus far to act harmoniously. Not one of them has such overwhelming strength that the others can be cowed into submission, whether they are acting alone or in groups. All of them have great financial resources, and all, too, have fixed obligations to meet which will put a check upon wanton attacks.

There is the possibility, too, that an identity of interests may be brought about by large financiers who have carried through more serious undertakings in other directions.

In any case, the result of the formation of the large consolidations of recent years has been to stimulate rather than check competition, and the disposition displayed in some quarters to exact high prices and gather very large profits has invited attacks. Even if there should be an even greater aggregation of interests, there will be brought home to them the conviction that there are limits to the lifting of prices, and that in the end costly opposition is created. We cannot help believing that in the long run the interests of the consumer will be protected by the inexorable law of supply and demand, there being no hope of controlling the mineral resources of this country and thus securing an unchallenged monopoly.

Pending Currency Bills.

Three measures affecting the currency have not only been introduced in the House of Representatives, but the Committee on Banking and Currency has seriously considered them, and is expected to report at least one of them at the present session of Congress. The end of the session is now so near, and the pressure of business is so great, that there is not much expectation of action. The important fact is that Congress seems to have outgrown its extreme timidity in the matter of sound money legislation, and to be ready, when time affords, to complete the reform of the currency which began with the cessation of silver bullion purchases in 1893 and approached completion with the gold standard law of last March.

Of these three bills the shortest and simplest is the bill of Mr. Overstreet, who had charge of the bill prepared by the monetary commission created by the In-

dianapolis convention. This bill declares that all gold and silver coins, except small change, shall be exchangeable at the Treasury. For this exchange the Secretary may use the gold reserve established by the law of last March, and silver dollars so received are to be simply impounded in the Treasury. No attempt is made to provide for the ultimate disposition of the silver owned by the Government. The bill of Mr. Hill of Connecticut, which is the one on which the committee has given hearings, provides that all United States and Treasury notes which are redeemed under the present law shall be destroyed and replaced by gold certificates against which gold is to be held. The reserve is to be equal to one-third of the notes outstanding and 5 per cent. of the silver dollars, and shall be used for the redemption of the notes and the exchange of the silver dollars. This would require a gold reserve a little larger than that provided by the law of last March, and the bill authorizes the sale of bonds when necessary to replenish this reserve.

The third bill, by Mr. Lovering of Massachusetts, deals only with the national bank currency. It provides that in addition to their note issues secured by bonds, as at present, banks may issue guaranteed notes, secured by the assets of the bank, and more specifically secured by a 5 per cent. guarantee fund, to be held by the Treasurer. The tax on the circulation shall be ½ per cent., and there are provisions for the redemption of notes. At the outset banks are not to issue these notes to an amount exceeding 20 per cent. of their bonds deposited, or 10 per cent. of their capital, but after three years these proportions may be increased to 40 per cent. of the bonds, or 20 per cent. of the capital, and after six years to 80 per cent. of the bonds, or 40 per cent. of the capital.

The plan is a gradual and guarded substitution of the general assets of the banks for Government bonds as a security for note issues. It would be followed by the abolition of the present requirement of bonds to secure notes. Secretary Gage and bankers very generally, and nearly all currency reformers, are in favor of the principle of this bill, because it would permit the banks to lend all their capital to the business community instead of lending much to the Government, and would easily admit of an increase of currency to meet special needs.

Another Machinists' Strike Threatened.

Trouble is brewing in the machinery trade. From present indications the International Association of Machinists are determined to make an effort this spring to bring into line the machinery manufacturers who have not joined in the agreement made last May by the above-named union and the National Metal Trades' Association. This organization of employers covers a large number of machinery establishments, but thousands of men are employed by concerns not included in its membership and who have thus far proceeded on their way with more or less indifference relative to the terms of the agreement under which a section of the trade is working. Under this agreement the time is rapidly approaching when the union machinists will work only 54 hours per week, instead of the 57 they are now working. The time when this reduction in hours takes place is June 1. As many shops are still working 60 hours per week, it appears to be incumbent on the officers of the machinists' union to get them in line, or the shops in which their rules are in force will be placed at a serious disadvantage after May. The strike in these unorganized shops, if one takes place, may be of a much more serious character than that of last spring. Numerous manufacturing establishments employ machinists as part of their force, and, while their work is indispensable in getting out the product, the men employed in other departments may outnumber them many times. If the machinists stop work, and their places cannot be filled, the entire establishment is compelled to shut down. Much depends upon the success of the labor leaders in inducing these scattered machinists to join the union, or, failing that, to co-operate with the union and walk out when a time is fixed for such action. The leaders appear to be quite sanguine on this point.

An interesting point is developing in connection with this question. The assertion is made by employing machinists that the reduction to a 54-hour week in the working schedule of machine shops will necessitate the enlargement of facilities to a sufficient extent to bring the output up to that attained on the 60-hour basis. This seems a reasonable proposition. To bring the output of a shop working 54 hours per week up to that of a similar shop working 60 hours per week means that the force working the shorter time must in some way increase their proportionate output over 11 per cent. to equal the efficiency of the force working 60 hours. It is of course, claimed that men who work on the short time basis can turn out as much as and perhaps even more than those who put in the full 10-hour day. Some employers of labor in other lines have indeed expressed their surprise and gratification to find that no diminution in the output of their works occurred when daily hours were reduced from 10 to 8. In such cases, however, the labor was largely manual and information was wanting on the important point of the possibility of the enforcement of more stringent oversight of the workmen when employed for the shorter time. Machine shop work is of a totally different character, depending largely on the speed of the tools and less on the alertness and ambition of the workman. In some departments of machine shop work it may be possible for men to put forth greater effort and accomplish considerably more per hour when working nine hours than they have been accustomed to doing in working ten, but the general result is more than likely to be a reduction in the daily amount of work accomplished corresponding with the reduction in the time. This must be keenly felt in such shops as are now working up to the full capacity of their facilities. If the machinery trade continues active it will certainly mean quite an increase in the equipment of all shops.

F. W. Ferguson, a New York banker, and J. H. Hillman & Son of Pittsburgh, are forming a company to operate the Robertsville-Ferguson Iron Mine on the Kingston & Pembroke Railroad, at Robertsville, Ont. It is understood that the entire output has been sold to a Buffalo furnace. The mine produces an ore low in phosphorus, and is high in metallic iron.

The business done in 1900 by the shipyards on the Delaware River was the largest on record, 77 new vessels having left the yards during the past 12 months. The value of the vessels exceeded $15,000,000. At present the various yards have under construction or contracted for 55 vessels, valued at over $35,000,000, including a number for the Government.

M. P. Coleman, dealer in second-hand machinery, tools and equipment, formerly at 95 Haverhill street, Boston, Mass., has removed his office to 725 Exchange Building, and has leased the large storage space under the Charlestown Bridge, where there are direct shipping facilities by rail and water.

R. D. Wood & Co. of Philadelphia have an order for 3000 tons of cast iron water pipe for Samarang, Java. The pipe varies in sizes from 4 to 30 inches, and is valued at $70,000, approximately.

OBITUARY.

PROF. ELISHA GRAY, D.SC.

Prof. Elisha Gray of Chicago, whose name is prominently connected with the invention of the telephone, died suddenly, on January 21, from neuralgia of the heart, while visiting in Newtonville, Mass. Professor Gray was best known to the public by reason of his contention that the credit for the invention of the telephone was due to him rather than to Prof. A. Graham Bell, but he also contributed a number of other important discoveries to the field of electrical and mechanical science and will be ranked as one of the foremost inventors of the age. Elisha Gray was born at Barnesville, Ohio, August 2, 1835. He began life as a blacksmith, and served an apprenticeship to a carpenter and boat builder. His scientific grounding was had at Oberlin College. There he studied physical science, constructed apparatus used in class room experiements, and acquired the knowledge of the time in regard to electricity and its application. He was at college five years, and six years later, after studying electrical mechanism, filed his first patent—one of the 50 inventions he thus protected. It was for an automatic self-adjusting telegraphic relay. In quick succession he invented the telegraphic switch and annunciator for hotels, the private telegraph line printer and the telegraphic repeater. He had some business ability and meantime had organized the Western Electrical Company, with works in Cleveland. In the early seventies he became interested in the transmission of sounds by electrical wires. On February 14, 1876, he filed a caveat at Washington with the expectation of perfecting the "art of transmitting vocal sounds telegraphically." Within less than a month Professor Bell received a broad patent for speaking telephones, which embodied Gray's idea to a certain extent. Both men claimed the credit for the priority of the invention, and the fact that Bell received the award after 25 years of litigation embittered Professor Gray in his late years. Professsor Gray was not able to put in any legal claim for rights himself because his patent rights were merged with the Bell patents by a deal between the Western Union Telegraph Company, who controlled the Gray patents, with the Bell Company. By this merger the Western Union Company received a yearly royalty of several hundred thousand dollars for staying out of the telephone field. Of this money Professor Gray got but a small share. A further claim for $12,000,000 was recently decided against the Western Union Company by the courts, and this gave to Bell practically the credit for priority.

Professor Gray also invented the telautograph to transmit writing or sketches by telegraph, and since the summer of 1899 he had been engaged in perfecting an invention for transmitting fog signals under water, which is stated to have been successfully tried but a short time ago. The financial results of all Professor Gray's labor and ingenuity were not, however, commensurate with his genius, and he died a poor and disappointed man.

THOMAS SHAW.

Thomas Shaw, a distinguished inventor and well known in scientific and engineering circles, died in a hotel at Hammonton, N. J., on January 19, from paralysis, aged 63 years. Mr. Shaw was born in Philadelphia and for 30 years was in business at 915 Ridge avenue, in that city. He was granted 186 patents on as many inventions submitted to the United States Patent Office, 91 of which covered engineering devices and improvements. More than 100 medals were awarded him at expositions and by scientific societies. Early in life Mr. Shaw began his career of invention and at 21 years of age was general superintendent of the Midvale Steel Works. He was the first man in America, it is said, to roll steel tires. His first patent was had from the United States Government in 1858, when he submitted a gas meter to the Patent Office. Among his inventions which are in use throughout the world were the mercury steam gauge; the noiseless steam exhaust, which is used on every locomotive and steam boiler; the Verona lock nut washer; the dead strike hammer and the Shaw gas tester, for detecting the presence and percentage of fire damp in coal; a propeller pump for sewage disposal plants, a hydraulic cushion buffer and a friction buffer for railroads. Mr. Shaw was a life member of the American Institute of Mining and Mechanical Engineers and was also a member of the Franklin Institute.

WILLIAM S. M'MANUS.

Captain William S. McManus died January 19 at his home in Chester, Pa., aged 60 years. He was ill ten days with pneumonia. After serving in the Civil War in the regular army, Captain McManus returned to his home in Reading, Pa., later going to Chester and organizing in 1877 the Chester Tube & Pipe Company, which he successfully operated for 20 years. Two years ago he organized the South Chester Tube & Pipe Company, which was sold to a combination a few months ago. At the time of his death Captain McManus was engaged in organizing a third company for the manufacture of tubing. He was active in public affairs and had an interest in several local concerns.

CLIFFORD B. HENDRICKS.

From an attack of pneumonia, which lasted but one week, Clifford B. Hendricks, a member of the firm of Hendricks Brothers, died at his home in New York on Monday, January 14. His death was most sudden and was a shock to the metal trade, where he had innumerable friends. He was in his prime, for his thirty-ninth year was but half spent. Most active in the copper and metal trade, he was admired by all for his sterling business qualities. While most devoted to his business he was also prominent in social circles. His favorite recreation he found in yachting. Immediately after having left school he became identified with the copper business, entering the old firm of Hendricks Brothers. He knew the practical workings of the business, having spent considerable time in the firm's rolling mills at Belleville, N. J. Latterly his time was devoted chiefly to the sales department at the principal office of the firm in New York. Mr. Hendricks was a member of the New York Yacht Club, the New York Club, the Fulton Club and other social organizations. He was one of the leading interests in the New York Museum of Natural History and was identified with many charitable institutions. He was born in August of 1862.

COMMODORE ALEXANDER HENDERSON, U. S. N.

Commodore Alexander Henderson, formerly chief engineer of the Boston Navy Yard, died January 12, at his home in Yonkers, N. Y., aged 69 years. He was born in Washington, D. C., and entered the navy as third assistant engineer, in 1851. After seeing service in many parts of the world and participating in various actions of the Civil War, Mr. Henderson, in 1882, was made the engineering head of the Naval Advisory Board. The engines of the first vessels of the new navy were designed by him and built under his supervision. When the work of the Advisory Board was finished, in 1889, he became chief engineer at the Boston Navy Yard, and filled that office until shortly before his retirement, with the rank of commodore, in July, 1894. The day after his retirement from active service he went into business as treasurer of the Manhattan Rubber Mfg. Company. Later he organized and conducted a steamship company, running a line of vessels along the coast of Maine. When the Spanish war broke out he volunteered his services, and again returned to active duty, serving until the close of the war as fleet engineer of the auxiliary navy.

BENJAMIN R. THURSTON.

Benjamin R. Thurston, a veteran member of the machine and tool industry of Rhode Island, passed away on December 31, at his home in Providence, aged 82 years. At different periods of his life, Mr. Thurston was connected with some of the largest manufacturing concerns in the State and became one of the best-known men in the industrial circles of Rhode Island. He was born at Hopkinton, R. I., and very early in life became engaged in business. He was engaged in the machinery trade in Providence, Pawtucket and other towns. In 1838 Mr. Thurston secured a position with the Eagle Screw Company. He left in 1850 to engage in business for himself, becoming associated with Benjamin H. Hadley in the manufacture of malleable iron castings. In 1860 he accepted the position of superintendent of the Providence Tool Company, but resigned

from this position in 1864. Shortly after this he became identified with William H. Haskell & Co., of Pawtucket, as superintendent, but returned to Providence in 1866 to accept a position with the American Screw Company, assuming charge of the New England mill on Eddy street. He discharged the duties of superintendent until his retirement from active business life in 1885.

CHARLES P. CHOUTEAU.

Charles Pierre Chouteau, for many years a prominent figure in the iron trade of St. Louis, Mo., died on January 5, at his home in that city, at the age of 81 years. Mr. Chouteau was the son of Pierre Chouteau, Jr., and grandson of Pierre Chouteau, Sr., who was one of the party that in 1764 founded the settlement from which the city of St. Louis grew. He was born in St. Louis and since 1838, when he was 19 years old, had been identified with the business interests of the city, first in the fur trade and later in the iron business. He had been continuously in business for the last 63 years, and in that time had much to do with the industrial development of St. Louis. In 1850 Mr. Chouteau entered the iron business, with which he was connected since that time, in association with his eldest son, Pierre.

CHARLES HUGILL.

On Thursday, January 17, Charles Hugill, who for more than 25 years had been the American representative of Hobson, Houghton & Co., the large English steel manufacturers, died after a brief attack of pneumonia. Mr. Hugill was for many years one of the prominent crucible steel merchants of this country, and his acquaintances and friends among the American consumers of tool steel were numerous. He was born in Stockton-on-Tees, England, in 1833. In his first business venture he was associated with his uncle in Darlington, England. He then joined the late John Palmer of Stockton, England, dealer in agricultural implements. In 1858 he came to this country, connecting himself with the cutlery house of Aslyn Ward & Co., where he remained until he received an offer from the firm of Wilson, Hawkesworth, Ellison & Co., where he remained for some time. He then accepted the agency for Francis Hobson & Son, which position he retained to the day of his death, completing a period of 26 years with this firm.

ELLWOOD W. KIMBER.

Ellwood Walter Kimber, secretary and treasurer of the Latrobe Steel Company, died January 20, at his home, 2131 Venango street, Tioga, near Philadelphia, of Bright's disease. Mr. Kimber was born in Philadelphia, January 29, 1854, and became connected with the machine works of William Sellers Company, as a telegraph operator. He was transferred in 1873 by Mr. Sellers, then president of the Midvale Steel Works, to fill a like position, from which he rose rapidly to that of secretary of the company. In 1889 Mr. Kimber relinquished his place to accept the treasurership of the Latrobe Steel Works. Two years ago he became secretary of the company, and continued to fill both positions to the time of his death.

NOTES.

HARRY STOUT, 34 years old, who was engaged in the iron business at Connellsville, Pa., died last week at the Homeopathic Hospital, Pittsburgh, where he had been under treatment for appendicitis.

JOSHUA ILLINGSWORTH, a superintendent of one of the departments of the American Steel & Wire Company's works, at Rankin, Pa., died January 15 from Bright's disease. He was born in England 40 years ago.

CHARLES WILLIAMS, proprietor of the Pearl River Foundry & Agricultural Works, at Jackson, Miss., died on January 14, at the age of 73 years. He was born in England and came to this country when a young man, locating at Reading, Pa., where he engaged in the manufacture of textile machinery. He subsequently removed to Manayunk, Pa., and later went to the Southwest, where he was occupied with railroading and manufacturing.

HON. JOHN LEISENRING, a well-known mine owner of Luzerne County, Pa., and former Congressman from the Luzerne district, died on January 19 from a complication of disorders, at the University Hospital in Philadelphia. He was born at Ashton, Pa., in 1853, and was by profession a civil and mining engineer. During his entire lifetime Mr. Leisenring was identified with the coal mining business, and he was also interested in a number of lumber and iron companies. He was president of the Upper Lehigh Coal Company and director of the Mossic Mountain, the Mount Jessup, the Silver Brook and the Midvalley coal companies.

WILLIAM ADDISON TOMLINSON, formerly a member of the firm of J. Tomlinson & Son, foundrymen and machinists, of Pittsburgh, Pa., died of paralysis on January 13 at his home in Oakmont, aged 68 years. He was born in Pittsburgh and had lived there all his life. For five years he was president of the Pittsburgh Common Council and he also served as treasurer of the Allegheny Valley Railway Company for some years.

HALSEY H. MONROE, the inventor of the rotary barrow, died on January 17 at his home at Thomaston, Maine, where he was born 78 years ago.

JOHN A. ZINN, a former partner in the firm of Matthews & Zinn, iron manufacturers, of Pittsburgh, Pa., died on January 10. He was born at Oakville, Pa., and went to Pittsburgh when 12 years old. He retired from business a few years ago.

PHILIP JAMES, a veteran iron man, who claimed to have puddled at Dowlais the iron for the first T rail ever made, died on January 14 at his home in Pittsburgh, Pa., at the great age of 88 years.

J. P. WARNER, a well-known citizen of Kansas City, Mo., died there on January 10, after a long illness, aged 63 years. He was well known throughout the West and Southwest through a long connection as salesman with the Washburn & Moen Mfg. Company, and recently with the American Steel & Wire Company. Mr. Warner had the distinction of selling the first pound of barbed wire fencing ever put upon the market.

ADNA BROWN, president and general manager of the Parks & Woolson Machine Company and of the Jones & Lamson Machine Company, of Springfield, Vt., died on January 14 at his home in that city as the result of a paralytic seizure. He was born in Antrim, N. H., in 1828, but had lived in Springfield for over half a century and was one of its most prominent citizens. Mr. Brown had served in the Vermont Legislature and filled a number of offices of honor and responsibility in the community.

WILLIAM POLSEN, head of the Polsen Iron Works, of Toronto, Canada, died on January 7 at his home in Toronto, at the age of 66 years. He was born in Montreal and was educated as a mechanical engineer, in which capacity he served for several years on Canadian railroads. In 1883, he established in Toronto the iron works which bear his name. A number of large steel steam vessels have been built by the concern.

WILLIAM B. RUDD died at his home in Lakeville, Conn., on the 8th inst., aged 62. He was born in Lyons, N. Y., and served in the Civil War as lieutenant in a regiment from this State. After the war he went to Lakeville. He married a daughter of Ex-Governor Alexander H. Holley, became identified with the business interests of his father-in-law and at his death assumed charge of the Holley Mfg. Company, well-known makers of pocket cutlery.

JAMES CLIFTON PEARSON, of Wakefield, Mass., and president of the J. C. Pearson Company, of Boston, died of peritonitis at the Eliot Hospital, Boston, Wednesday afternoon, January 9, after an illness of three days. Mr. Pearson was born at Wilmington, Mass., March 6, 1864, and after completing his education in that town, entered the boot and shoe trade in Boston. In 1889 he entered the wire nail trade, placing upon the market the Cement Coated Nail, which by his perseverance and untiring energy has had a wide sale throughout the country. He was also identified with other large enterprises.

EDWARD NOYES WICKES, vice-president of Wickes Brothers, foundrymen and machinists, at Saginaw, Mich., died January 13 at his home in Saginaw, at the age of 65 years. He was born in

Starkey, Yates County, N. Y., and in 1854 became associated in the foundry business with his brother, H. D. Wickes, at Flint, Mich., in the firm of H. W. Wood & Co. In 1865 the concern removed to Saginaw and a few years later, on the retirement of Mr. Wood, the title was changed to that of Wickes Brothers.

MAJOR JAMES WREN died on January 16 in the Jefferson Hospital, Philadelphia, after an operation for cancer. The deceased was a mechanical and mining engineer of considerable experience, and at one time was proprietor of extensive foundry and machine shops at Pottsville, Pa. Major Wren served with distinction during the Civil War, and received a gold medal from Congress. He was 76 years of age.

The Carnegie Steel Company Buying Pig Iron.

This week the Carnegie Steel Company of Pittsburgh bought from the Bessemer Furnace Association 150,000 tons of standard Bessemer pig iron, at $12.50 at furnace, or $13.25 delivered at their mills. This is the first purchase of Bessemer iron made by the Carnegie Steel Company for some months, and it is bound to have a beneficial effect on the market. It may be noted, however, that the price of $12.50 at furnaces is extremely low, based on the fact that the furnaces are running on ore at $5.50 a ton, high priced coke and also on labor which is being paid the same prices as when Bessemer iron was selling at $24 a ton. The furnaces, however, will have the benefit of lower labor costs after February 1, which, no doubt, influenced them to a large extent in selling this iron at such a low price.

In this connection some figures as to the capacity of the Carnegie Steel Company in making pig iron and steel may be of interest. The company own nine blast furnaces at Bessemer, four at Duquesne, two Lucys at Pittsburgh and two Carries at Rankin. They are also building two new Carries at Rankin, which are almost completed and ought to be ready for blast some time in February. It was expected to have these furnaces ready by January 1, but owing to delays of various kinds they will not be blowing before next month. Remarkably quick time was made in the building of these stacks, and the Riter-Conley Mfg. Company of Pittsburgh, who had the contract for the iron work, are entitled to considerable credit for the quick work they have done. Putting the capacity of these two Carrie furnaces at 700 tons a day each, the Carnegie Steel Company, at their 19 furnaces, will have an annual capacity for making 2,700,000 tons of pig iron. This, however, falls considerably short of meeting their requirements, as their capacity for making steel at their Duquesne Steel Works, the Homestead Steel Works and Edgar Thomson Steel Works is 3,340,000 tons of Bessemer and open hearth steel. Of this tremendous tonnage, their capacity for making Bessemer steel is 1,780,000 tons and of basic open hearth 1,650,000 tons. Taking their output at 2,700,000 tons and deducting 10 per cent. for waste, it would leave the Carnegie Steel Company to make up in scrap and purchases of iron in the open market nearly 900,000 tons of material. More than half of this, however, is made up in scrap, which is used so largely in the making of open hearth steel. These figures for production are tremendous and are not approached by any other steel concern in the world.

The Standard Pneumatic Tool Company, Marquette Building, Chicago, have put on the market their new Little Giant Motor No. 0, which is designed for the heaviest service that a portable machine can perform. It is made on the same mechanical principle as their smaller piston air drills, having double balanced piston valves, which cut off at five-eighths of the full stroke, making it possible to run a large motor economically. It is a powerful motor for boring cylinders of any size and for reaming, tapping and drilling holes in extra heavy boiler plate of any diameter.

PERSONAL.

Don H. Bacon has been formally elected chairman of the board of the Tennessee Coal, Iron & Railroad Company. He was also elected a director in the place of B. Y. Frost, who has resigned.

R. L. Henry, formerly president of the Champion Iron & Steel Company, Chicago, and Muskegon, Mich., is now at the head of the Chicago Cash Register Company, with offices in the Marquette Building, Chicago.

Andrew Carnegie has donated $50,000 to the city of Aurora, Ill., and $15,000 to Goshen, Ind., for the purpose of founding libraries in each place. Each gift is coupled with conditions which must be carried out to secure the payment of the money.

The crowd of officers who ran the Paris Exposition, much to their own satisfaction, have succeeded in recommending themselves to a man for the final honors. Outside of the charmed circle the well deserved distinction of the Legion of Honor has been conferred upon Henry M. Howe of Columbia University, Alexander Gordon, Charles A. Moore, Charles T. Schoen, Ambrose Swasey and George Westinghouse.

The American Bridge Company announce that their New York contracting office will hereafter be in charge of S. Fisher Miller, formerly with Milliken Bros.

J. G. Caldwell, formerly manager of the Birmingham (Ala.) Rolling Mill, before it was absorbed by the Republic Steel & Iron Company, has been made manager of the company's Tudor works in St. Louis, Mo.

Andrew Carnegie has offered to give $200,000 for a public library building in Syracuse, N. Y., provided the city will provide a good location and guarantee to spend $30,000 a year for its maintenance. The city has agreed to fulfill the requirements.

R. C. Bowman, auditor at the National Tube Company's rolling mill office, at McKeesport, Pa., has been transferred to the company's main office in Pittsburgh as assistant to the general purchasing agent.

John W. Harrison, president of the Shickle, Harrison & Howard Iron Company of St. Louis, Mo., has disposed of his entire holdings in the business which he has conducted for the past 32 years, and will retire from active business life. Mr. Harrison's interests in the company, amounting to between $400,000 and $500,000, have been purchased by his nephew, John W. Harrison, Clarence R. Howard and George B. Leighton, who, respectively have held the positions of third vice-president and general manager, second vice-president and sales agent and first vice-president. The concern will retain their old name and continue in the steel casting business in East St. Louis.

Charles T. Schoen, president of the Pressed Steel Car Company, and George Westinghouse of the Westinghouse interests, Pittsburgh, have been made chevaliers of the Legion of Honor by the French Government in connection with the Paris Exposition.

Thos. Williams of Warren, Ohio, has been appointed superintendent of the roll turning department of the Republic Iron & Steel Company, at Youngstown, Ohio.

W. E. Corey, superintendent of the Homestead Steel Works, who has sailed for Europe, was given a banquet at the Hotel Schenley, Pittsburgh, by the Department Superintendents' Club of the Homestead Steel Works. In behalf of the club Mr. Corey was presented by Chief Clerk C. E. McKillips with a gold mounted Parisian vase. C. M. Schwab and others made impromptu speeches.

W. P. Snyder, the well-known iron and steel merchant, together with Henry W. Oliver and J. B. Oliver, of the Oliver interests, all of Pittsburgh, sail on the "Princess Louise" on Saturday for an extended trip to South America, Porto Rico, the Hebrides and other points of interest. The trip will be purely an ocean voyage, and will last six or seven weeks. George S. Oliver, also of Pittsburgh, will be in the party.

E. B. Hull, formerly superintendent at the Fannie furnace of the American Steel Hoop Company, has re-

cently resigned to accept the position of assistant superintendent of the furnace department with the Maryland Steel Company of Sparrows Point, Md.

A. S. Hay of Naylor, Benzon & Co., London, is due on the "Oceanic" to-day.

S. V. Huber of Pittsburgh and Geo. D. Wick, president of the Youngstown Iron Sheet & Tube Company, have concluded a series of tests and a tour of investigation of the Perrins tube welding process in England. Mr. Wick was a passenger on the "Oceanic," which arrived in New York yesterday. Mr. Huber will sail for this country this week. He is now making a short trip to Germany. The voyage was in the interests of an American syndicate, who have obtained control of the American rights for using the process.

Wesley Meeteer, who has been with the Jackson & Sharp Company, Wilmington, Del., for a number of years in the capacity of purchasing agent, has resigned and accepted the position of vice-president and general manager of the American Machinery & Export Company of New York.

Trade Publications.

"Gus" Gas and Gasoline Engines.—We have received a catalogue of the "Gus" gas and gasoline engines manufactured by the Carl Anderson Company, Jefferson and Fulton streets, Chicago. The engine made by this company is built on the four-cycle principle, being so constructed that it gives an impulse or explosion every alternate revolution. The bed of the engine is designed to withstand great strain, additional strength being obtained by heavy ribs cast in it. The valves used have no gear wheels to get out of order. The exhaust valve is operated by a simple contrivance consisting of a cam and roller. The cam is keyed to the main shaft, making it impossible to get the valve out of time in any form or manner. The governor is so constructed as to give an impulse regularly every alternate revolution, varying the charge and mixture according to the load. The engine can be run with either a tube or electric igniter. All parts of the engine are stated to be made of the best material and with the most accurate workmanship. Stationary engines are built, ranging from 2 to 25 horse-power. The company also build portable engines, mounted on steel trucks, of 3 to 15 horse-power.

The Waterloo Gasoline Engine.—The catalogue of the Waterloo Gasoline Engine Company, Waterloo, Iowa, which has just been issued, describes both horizontal and vertical engines. The company build such engines ranging from 2 to 3 horse-power. The horizontal engine has the cylinder and base cast in separate pieces, while in the vertical engine these are cast in one piece. Besides the horizontal and vertical engines, the catalogue contains illustrations of a new pumping outfit, a portable engine, and a 4 horse-power engine set up complete and fitted with both spark and tube igniter.

The Republic Iron & Steel Company's Products.—We have received from the Republic Iron & Steel Company, Chicago, a copy of their new catalogue and price-list. It is a volume of 221 pages, in flexible leather cover, and contains the standard iron and steel lists, nail card, standard steel specifications, nut and bolt lists, lithographs of sections made, &c. In addition to an alphabetical index, covering six pages, the work of referring to the contents is further facilitated by a marginal index.

The Baldwin Automobile Mfg. Company of South Connellsville, Pa., have made an assignment for the benefit of creditors. The company have a capital stock of $250,000. It is said the failure is due to too much costly experimenting. Sixty per cent. of the creditors are willing to allow the company a year to pay off the indebtedness, and it is thought the others will agree. The Hartley Rose Belting Company of Pittsburgh have filed a petition in the courts against the Baldwin Automobile Mfg. Company, asking that the concern be declared bankrupt.

The Business Situation in the Naugatuck Valley.

To one who traveled through the "Valley" a few months ago with an eye open to general conditions, a trip at this time with a similar purpose cannot fail to disclose marked changes. In the early fall of last year, although there were signs of the impending change, the manufacturers constituting that great brass colony were still working under the strongest agreement that has ever existed among American manufacturers. At that time the mill owners were still subservient to the central body. The price was regularly named by the association.

Now the keenest competition is in force and the comfortable margin which the brass trade formerly enjoyed has been wiped out entirely. If ever brass was cheap, it is so to-day. Just how far prices have receded during the last four months it is difficult to ascertain. It is known, however, that the decline has amounted to more than 10 per cent. The future depends largely upon the course of the copper market.

The large mills throughout the Naugatuck Valley, while not especially rushed, are fairly busy. In various quarters it is plainly discernible that preparations are being made for the future and that the mills are being prepared for a prolonged struggle. Under conditions such as exist at present it is always the mill which can produce at the lowest cost that is best arrayed for the battle. In this direction there is a movement. Another factor which figures largely in times such as these and which is being taken advantage of now, is that the concern who are enabled to consume largely of their own product of the raw brass hold a handicap over their competitor who may not be so fortunately situated. Hence the additions to the various novelty and specialty works owned by the large brass interests.

Since the acquisition of the Benedict & Burnham Mfg. Company by the American Brass Company nothing has been done by the latter concern in the way of acquiring additional plants. There has been some talk, however, of plans looking toward a consolidation of the large interests who are not included in the American Brass Company. As far as we can learn this has only amounted to talk thus far, and while some regard the project in a light manner, others speak in a more serious vein.

Doubtless the most important work in the shape of additions to plants is that which is now under way at Scovill Works, in Waterbury. It will be recalled that this concern have arranged for the driving of all the machinery in their various novelty shops by electricity. The central power station which will supply the electric current is very near to completion, and it is hoped that the machinery will be ready to start within the next week. The buildings for the new novelty shops are completed and arrangements are being made for equipping them. With the great new brass rolling mill fate has dealt differently. It has been a most difficult matter to obtain prompt delivery of the structural steel for the frame of the building, and consequently the work has been held back materially. It is rumored that the equipment of the present brass rolling mill will be removed to the new building, and that the building thus vacated will be fitted out as a tube mill. In connection with the extension of the novelty departments it is said that portions will be fitted out for the manufacture of spoons and watches, both of which are new lines for this company. A large coal storage plant is being built in conjunction with the electric station and mechanical apparatus for unloading the cars is to be installed.

The extensive additions to the rolling mill of the Plume & Atwood Mfg. Co., which is located at Thomaston, are quite completed. Work is not being pushed particularly, as the extension is to be equipped in the most careful and economical style, with an eye to the future rather than for the moment.

An extension is being built to the new rolling mill recently erected by the Waterbury Mfg. Company of Waterbury. The mill had scarcely been placed in operation when it was found to be inadequate. The product of this mill is used solely by the Waterbury Mfg. Company and the Waterbury Clock Company. None of it is placed on the market

Another manufacturing company who are building a mill to manufacture their own brass are the Bristol Brass & Clock Company of Bristol and Lawrenceville, Conn. The new mill is being built directly outside of Bristol. It will be of sufficient size to enable the company to produce all of the brass which they consume in their manufacturing business.

The present demand for brass seems to be well distributed over all of the lines, none of the various branches being either especially brisk or dull. The extraordinary activity in shipbuilding keeps the condenser tube business thoroughly alive. The large exportation of locomotives is also beneficial to the tube makers, as the locomotives built for export contain brass boiler tubes.

As for general export business in brass and copper goods, considerable attention is being paid to new fields which have lately opened themselves to the American brass manufacturers. Much interest is being taken in the great order for electric transmission wire which was recently received from India. The order called for 1,000,000 pounds of copper wire, and when loaded for shipment the consignment will fill at least 20 cars. The order was taken by the American Brass Company and the Ansonia Brass & Copper Company and the Coe Brass & Mfg. Company have worked jointly in filling the order. It is the largest single order for copper wire for export that has ever been taken in the Valley. The wire is finished and was awaiting the completion of transportation arrangements by the railroad company last Saturday. The order was placed through the General Electric Company, who are furnishing all of the electrical apparatus for the project, which is an unusually large hydraulic-electric power plant to be located at the falls of Convery, India. The power is to be transmitted for long distances and is for operating machinery in the gold fields of the Kolai district, Mysore, India.

In brass goods the export movement is not as brisk as it has been. This is particularly the case as to European business. It is to other fields that the manufacturers are looking for an outlet. Mexico and South America have been showing good signs, and Australia is taking up considerable copper work in the advancement of her electrical operations. At South Africa there is a considerable quantity of brass and copper goods awaiting the first opportunity to be pushed into the interior. The poor business conditions in Germany are, of course, felt somewhat by the brass contingent, but this is in a measure compensated for by an increased activity in the electrical undertakings of Great Britain. China is, of course, still a subject for conjecture, but there have been signs which indicate that a little electrical apparatus may be squeezed in through the gates or thrown over the great wall when the political situation becomes more tranquil.

The Ansonia Brass & Copper Company are the recipients of a little international fame, for they are to sheath with Tobin bronze both of the yachts now building in this country, the better of which is to vie with Sir Thomas' new boat.

As to the copper market, the opinion universally expressed is that the metal, being so strongly held and as the deliveries on back contracts have recently been heavy, not much of a decline can be looked for at least until the reopening of navigation. That the market is not thoroughly firm at present prices is, however, admitted. New contracts will doubtless have to be made before the reopening of navigation, as the supply in the Valley seems to amount to something like a month's consumption. Spelter is considered very cheap and the mills are pretty well fixed in the wa of heavy stocks.

The Engineers' Society of Western Pennsylvania met in Pittsburgh last week and elected the following officials: H. W. Fisher, president; Prof. J. C. Phillips, vice-president; C. W. Ridinger, secretary, and A. E. Frost, treasurer. W. A. Bole, the retiring president, made an address, in which he set forth the progress made in engineering during the last century.

The Beaver Dam Malleable Iron Company, Beaver Dam, Wis., have erected and equipped a new laboratory. F. G. Coffeen, formerly of the Deering Harvesting Machine Company, is in charge.

MANUFACTURING.

Iron and Steel.

A project is on foot to establish a rolling mill at Brazil, Ind. The mill operated at that point for many years by the Central Iron & Steel Company, and now owned by the Republic Iron & Steel Company, has been closed for a long time, as the new owners find it more profitable to concentrate manufacturing operations at plants in other localities. The citizens of Brazil, however, are anxious that the manufacture of bar iron shall be continued and are therefore actively endeavoring to have a new enterprise started. The subscriptions received by the committee in charge are reported to be very encouraging to the promoters.

The Niles Furnace of the National Steel Company, at Niles, Ohio, was blown in on the 17th inst.

A press dispatch from Muncie, Ind., states that John L. Smith, district superintendent of the Republic Iron & Steel Company, has retired. It is rumored that Mr. Lawrence, together with Wm. N. Myers, a former officer of the Indiana Iron Company, and W. C. Ely, one of the former owners of the Marion Iron & Steel Company, are interested in the rolling mill project at Terre Haute.

The Reading Iron Company, Reading, Pa., have their engineers at work on the designs and plans for another universal or continuous skelp mill, which they contemplate building, to make widths ranging from 6 to 22 inches.

The United Automatic Machine Company, Buffalo, N. Y., have incorporated with a capital stock of $50,000. The company own the Pan-American automatic drinking fountain, which they are now putting on the market.

The Elliott-Blair Steel Company, New Castle, Pa., makers of cold rolled steel, are contemplating the enlargement of their plant.

The Milton Iron Company, Milton, Pa., are replacing their old cylinder boilers over puddling furnaces with new, up to date tubular boilers.

The Inland Steel Company, Marquette Building, Chicago, have increased their force of men in the works at Chicago Heights, and are running to full capacity. The company have enough orders ahead to keep them busy for several months, and report the greatest amount of trade coming from the Central West.

The United States Cast Iron Pipe & Foundry Company, with offices in The Rookery, Chicago, have closed down their various plants for annual repairs. The company will make minor improvements and will prepare for a good year.

The stockholders of the Kelly Nail & Iron Company, Ironton, Ohio, held their annual meeting last week and elected the following directors: W. H. Franklin, D. S. Gray, E. L. Hinman, Charles Parrott of Columbus; Ironton A. Kelly, Oscar Richey and W. A. Murdock of Ironton. The board organized by electing Oscar Richey, president; Ironton A. Kelly, vice-president; T. J. Hayes, secretary and treasurer. A 50 per cent. cash dividend was declared and a large sum passed to the surplus fund from the earnings of the company during the past six months. This makes dividends amounting to 220 per cent. declared by this concern in 18 months.

The stockholders of the Brier Hill Iron & Coal Company, at Youngstown, Ohio, met last week and elected the following Board of Directors: George Tod, Henry Tod, Wm. Tod, H. H. Stambaugh and J. G. Butler, Jr. The directors organized by electing Geo. Tod, president; Henry Tod, vice-president; H. H. Stambaugh, secretary and treasurer, and J. G. Butler, Jr., general manager.

A meeting of the Board of Directors of the Sharon Steel Company has been called to be held in the offices in South Sharon, Pa., on Tuesday, January 22. At this meeting action will be taken on the proposition of the American Tin Plate Company to take the entire output of tin and terne plate of the Sharon Tin Plate Company at the market price, less 2 per cent. for cash.

At Pittsburgh a petition has been filed in the courts asking for a dissolution of the firm of Wm. Clark's Son & Company. This concern formerly operated the Solar Iron & Steel Works in Pittsburgh, but were taken over by the American Steel Hoop Company.

The Bessemer plant of the Republic Iron & Steel Company at Youngstown, which has been idle for several weeks while changes in machinery were being made, will be started up on Monday, January 28.

The Niles Iron & Sheet Company, Niles, Ohio, advise us that the foundations for their new sheet mills are completed and that the McClintic-Marshall Construction Company of Pittsburgh, who have the contract for the building, expect to have it finished inside of 30 days. The offices are nearly completed, railroad switches are all laid and nearly all the machinery is on the ground. This concern expect to be making iron and steel sheets not later than April 1. The officials of the concern are James S. Patterson, president, and W. A. Thomas, secretary and treasurer.

J. H. Bailey, secretary and manager, and A. Chamberlain,

assistant manager, have retired from the Mahoning Mfg. Company at Youngstown, Ohio. Edwin McEwen has been appointed to succeed Mr. Bailey. The concern manufacture structural and boiler rivets.

Machinery.

The Petroleum Iron Works Company, Washington, Pa., manufacturers of riveted boilers, riveted tubing, pipe cylindrical tanks, pressed steel tanks, car sides, &c., have just built a complete hydraulic riveting plant. The building in which this plant is placed is of sheet iron, with a tower 75 feet high. A 10-ton hydraulic traveling crane and a 48-inch throat power punch made by the Hilles-Jones Company of Wilmington, Del., have been installed. The other departments are completely equipped with the most modern appliances and the capacity largely increased. The officers of the company are J. S. Cullinan, president; E. G. Wright, vice-president; C. S. Ritchie, treasurer; A. W. Krouse, secretary; C. H. Todd, manager.

The Schenectady Locomotive Works, Schenectady, N. Y., will build a new blacksmith shop of brick, 400 x 125 feet. When the new shop is completed the present one will be used as a machine shop.

Curry & Vannan, Danville, Pa., report having had an excellent business during 1900, and prospects for the present year as being very promising. They have recently delivered a 20-inch three high puddle train to the Milton Mfg. Company, Milton, Pa., and a 28-ton fly wheel cast in halves for the Reading Iron Company's Montour rolling mills department, Danville, Pa., and for the same company at their Reading works a guillotine shear. They have just completed a contract for architectural work for South Africa.

It is rumored that the Newton Machine Tool Company, Twenty-fourth and Vine streets, Philadelphia, expect to build an entire new works. English capitalists are negotiating with them with the view of building a plant for large types of machine tools, steam hammers and hydraulic machinery. We understand that C. C. Newton will remain president and hold a controlling interest. The management will not be changed.

The Solid Steel Tool Company, 64 and 66 South Clinton street, Chicago, report that on account of the increase in their business they have been obliged to purchase considerable new equipment which will include lathes, shapers, shears, punches, grinders and smaller tools, all driven by motor power. The new appliances will enable the company to increase their capacity to 20 tons of finished steel railroad tools per day, and will involve an expenditure of nearly $20,000.

Andrew Henderson, recently foreman of the Los Angeles Railway Company's shops, is organizing a stock company at Whittier, Cal., for the purpose of putting up a large machine shop. Enough subscriptions have been secured to warrant going ahead with the plant. A tract on the Southern Pacific Railroad has been secured. The company will make a specialty of oil well work.

The Buckeye Engine Company report through their Chicago manager, H. E. Troutman, Marquette Building, that the company are erecting a new building at their works at Salem, Ohio, to be utilized as a foundry. The dimensions are 80 x 200 feet and steel construction will be used. The Niles Tool Works Company will supply most of the tools, which will be driven by electrical power.

Among recently licensed corporations in Illinois are the T. L. Knudtson Machinery Mfg. Company, 71 and 73 West Adams street, Chicago, with an authorized capital of $30,000, to manufacture wall paper and laundry machinery, and to maintain general machine works. The officers of the new company are as follows: President, T. L. Knudtson; vice-president, Milton Daily; secretary and treasurer, Frank E. Daily. T. L. Knudtson was formerly head of the firm of T. L. Knudtson & Co.; Milton Daily was superintendent of sales agents for the McCormick Harvesting Machine Company, and Frank E. Daily was a traveling salesman for the same company.

The proprietors of the Excelsior Iron Works, 96 to 100 North Clinton street, Chicago, have just sent the following letter out to the trade: "We beg to announce the sale to the Winslow Elevator & Machine Company, of all our tools, machinery and good will in the business conducted for so many years under the name of the Excelsior Iron Works. As our successors, they will be glad to serve you, and we sincerely hope you will extend to them the patronage that we have enjoyed, feeling assured that their energy and intimate knowledge of the business will be appreciated by you." The Winslow Elevator & Machine Company have secured the contract for the mechanical devices, gears, &c., for the Ninety-fifth and Division street bridges, Chicago.

The Republic Iron & Steel Company are making arrangements to build a natural gas pumping station near Cammack, Ind., which is to cost $100,000. The plant is designed to insure an ample supply of fuel for all the company's works in the gas belt.

The Cleveland Punch & Shear Works Company of Cleveland, Ohio, have put their new battery of boilers in operation January 17, and will soon have their new engine installed and running. They have recently received an order from the Government for one of their heavy punches for the Mare Island Navy Yard; an order for a 72-inch multiple punch for the Ohio Cultivator Company, Bellevue, Ohio, and eight punches for the American Car & Foundry Company, Detroit.

Butts & Ordway Company, Fort Hill Square, Boston, have purchased Brine's easy punch, which will hereafter be manufactured and sold by them in connection with their "B. & O." line of tools for blacksmiths and wagon makers. The Easy punch is made in two sizes—viz., three and four punches respectively. The manufacturers claim that this is the best working metal punch made, having the tools always ready for working together or separately. The dies interchange without adjusting, and will punch with one man power ⅝-inch hole in ⅜-inch iron, ½-inch hole in ¼-inch iron, and will do the work in one hour that would take ten hours on a drill. The quadruple punch has an open throat with die set close to front for punching angle or T-iron as close as ¾-inch from inside angle; on sheet metal punches 6¼ inches from edge.

The annual meeting of the stockholders of the Kewanee Boiler Company, Kewanee, Ill., was held January 8. The old Board of Directors was re-elected as follows: E. E. Baker, Horton Vail, August Wagner, T. P. Peirce, B. F. Baker and J. P. Dugger. After the meeting of the stockholders the directors met and re-elected the following officers: President, E. E. Baker; vice-president, Horton Vail; secretary, J. P. Dugger, and treasurer, B. F. Baker.

The John Ramming Machine Works, St. Louis, builders of engines and contractors for complete steam and power plants, are practically rebuilding their shops, located at Main street and Clark avenue, the factory continuing in active operation among the improvements. The machine shops will have 54-foot truss span and be 103 feet long. A traveling crane 28 foot span will serve one side. The other side will have a gallery of 9 feet 6 inches head room, extending the full length of the building. The shop will be heated and ventilated by the hot blast system. Pneumatic hoists and small tools will also be installed.

The Lebanon Foundry Company, Lebanon, Pa., have elected the following officers and directors: Dr. J. H. Mease, president; J. W. Davis, secretary and treasurer; Frank Bowers, general manager; Geo. B. Woomer, Esq., and H. S. Dunn. The plant will be enlarged by an addition 60 feet square, which will be completely equipped with the most modern appliances. This addition, with other contemplated improvements, will double the capacity of the works.

The Philadelphia & Reading Railway Company of Philadelphia, Pa., advise us that they will erect a new boiler house at Reading. The structure will be of brick, one-story high, the dimensions being 31 feet 10 inches wide by 91 feet 11 inches long, supported by stone foundations and covered with granulated slag roofing. Its equipment will consist of boilers and air compressors complete, dust collector and furnace feeder. It will be located on the railway company's property on Sixth street above Oley street, in that city.

The Camden-Anchor-Rockland Machine Company, Rockland, Maine, who recently incorporated with a capital stock of $300,000, are a consolidation of the Camden Anchor Works, Camden, and the Rockland Machine Company, Rockland, Maine. The new company will manufacture anchors at their Camden plant and gasoline engines, and do general marine and stationary engine and boiler work at their Rockland plant. A large brass and iron foundry is to be established at the latter and a new boiler shop will be built in the spring. The Camden works will also be greatly improved. The directors and officers of the company are W. G. Alden, president and general manager; A. D. Bird, treasurer; John Bird, manager of the Rockland plant, S. T. Kimball and A. J. Bird.

The Springfield Boiler & Mfg. Company, Springfield, Ill., are furnishing the heat and power plant for a large office building in New York City. They are now actively engaged on a large order for riveted pipe, to be used in placer mining in British Columbia. The company are making a great deal of machinery for the Anaconda Copper Mining Company, and also for the Boston & Montana Smelting Company. Their business has grown to such an extent that they are now employing 250 men, as against 80 men four years ago.

W. H. Harrington has retired from the firm of W. H. & J. C. Harrington, iron founders, at Montrose, Pa. J. C. Harrington will continue the business.

The Hyde Park Foundry & Machine Company, Hyde Park, Pa., will increase their capacity by building an addition, 60 x 80 feet, to their works, and installing a plant for the casting of rolls and heavy machinery. The work will be commenced at once and put in operation at the earliest date possible. The present expansion is necessary to meet the demands of their increasing trade.

The Interstate Foundry Company of Cleveland, Ohio, are, during the construction of their new plant in that city, operating the International Foundry at Ashtabula and the Van Wagoner & Williams at Cleveland. Their new plant, when completed, will be thoroughly up to date and the largest in Cleveland for the manufacture of light gray iron castings.

The F. S. Perkins Company, Lowell, Mass., have incorporated with a capital stock of $12,000. The directors are A. B. Woodworth, president; W. E. Grady, treasurer, and Hubert Varney. The new company will continue the manufacture of engine lathes and other machine tools, and will use the old plant of the late F. S. Perkins.

The Griffith-Powell Company, Norfolk, Va., who recently incorporated, have opened a store at 268 Water street, with a complete line of railroad and mill supplies. Lathes, drill press, pipe cutting machinery, &c., of the latest design have been installed, and the company will make a specialty of repairing machinery.

The Standard Railway Equipment Company, St. Louis, with offices at Chicago, Pittsburgh, Philadelphia and New York, find their factory facilities inadequate to meet the demand for their Monarch pneumatic tools. They contemplate moving from their present quarters and now have several buildings in St. Louis under consideration. C. C. Murphy is now representing the pneumatic tool department in Chicago.

The Magnetite Foundry Company, Manchester avenue, St. Louis, started the present year with at least double the capacity of last year. A rearrangement is now being made in the molding room by which additional clear space will be given that department. The two cupolas will be grouped and the charging platform served by a Crane steam elevator. They will also have one blower in common. An electric plant will be installed to furnish both lighting and power current, and the present hand traveling crane will be equipped with electric motors.

Under the charter name of the Mohawk & Hudson Mfg. Company, the Eddy Valve Company of Waterford, N. Y., have been doing business for the past 25 years, and of late years, on account of manufacturing specialties in the way of valves, hydrants, &c., have been known to the trade as the Eddy Valve Company. As the charter recently expired, it was thought desirable to incorporate under the name of Eddy Valve Company, to continue in the same line of manufacturing, the same location, the same personnel in the directors and officers, &c. The concern are one of the largest manufacturers of valves and hydrants in the United States, as well as one of the oldest. The company have facilities to manufacture valves in much larger sizes than they ever have been made, although it is not unreasonable to look for the time when valves 96 inches in clear opening, that they can produce, will be called for. Twenty years ago a 24-inch valve was considered a large one, but in these days those that have a clear opening of 48 inches are made in quite large numbers, and 60 inches are not infrequently used.

Plans are about completed for the new shops to be built by the Baltimore & Ohio Railroad at Connellsville, Pa., to replace shops recently destroyed by fire. Plans call for a brick building somewhat larger than the old one.

The Youngstown & Sharon Street Railway Company have given a contract to the Westinghouse Electric & Mfg. Company of Pittsburgh for dynamos and motors for the power house and cars of the new line. The contract price is said to be $120,000.

The Allegheny Roll & Machine Company of Pittsburgh have been chartered with a nominal capital of $1000. The directors are H. E. Sheldon, Leechburg; R. D. Campbell and A. E. McKee of Pittsburgh.

Hardware.

The Gem City File Works, Quincy, Ill., have just completed a large addition to their works, but find their business continues to grow and will shortly be obliged to enlarge still further.

The H. P. Hughes Company, 157 South Jefferson street, Chicago, have changed their name to the American Saw & Knife Works.

The City Forge & Iron Company, now located at 25-27 Wyandotte street, Dayton, Ohio, are preparing to move to their new building, 420-422 East First street, where in addition to their architectural and ornamental iron and steel work, forgings, &c., they will make a number of new lines. The new building, which is of brick, two stories, has a frontage of 50 feet by 150 feet in depth, and will be equipped with a number of new tools and appliances. Mr. Andrew Plocher, the proprietor, states that the outlook for 1901 is very bright and they start the year with a number of nice orders.

The Dillon-Griswold Wire Company, Sterling, Ill., have installed machines for the production of their Griswold woven wire fencing, which has heretofore been made at their Eastern mill and shipped to Sterling. The business has grown to such an extent that the company found it necessary to put machines in at Sterling for the manufacture of larger quantities of the fencing and the prompt shipment of orders. This fencing is built up as follows: The top and bottom cables are No. 9 wire, intermediate wires No. 11, and mesh wires No. 13. The mesh wires can be changed to heavier or lighter if the customers so desire.

The Eagle Horse Shoe Company's works at South Milwaukee, Wis., were badly damaged by fire on the night of January 21.

Miscellaneous.

The Atchison, Topeka & Santa Fé Railroad Company are reported to be making arrangements for establishing a large tin shop in connection with their railroad shops at Topeka, Kan. The company contemplate the manufacture of lamps, head lights, oil cans and other articles of tinware at Topeka to supply their entire system.

The Scranton Mercantile Company, Scranton, Pa., State agents for J. H. & C. G. Warren of Worcester, Mass., have closed a contract with the Lackawanna Iron & Steel Company to supply the plant of their new works, at Buffalo, N. Y., with a 40-inch double leather belt 81 feet 6 inches long, and also a 24-inch double leather belt.

The Heaney Company, galvanizers of iron, 42 to 50 North Morgan street, Chicago, are equipping their shops with new tools, and have doubled their working force in consequence of the large number of orders on hand.

The New England Bridge Works, St. Albans, Vt., who recently organized, have purchased the entire stock and equipment of the Vermont Construction Company, and are rebuilding the plant. Tools and machinery of the latest design are being installed, and the works completely equipped for the building of steel and iron bridges, girders, structural work, &c.

The Howard Elastic Wheel Company, Kalamazoo, Mich., manufacturers of the Howard elastic steel vehicle wheel, have leased a plant, and will be ready to supply the demand for their goods about March 1.

The Donaldson Iron Company, Emaus, Pa., manufacturers of cast iron pipe, are constructing an additional chipper building of brick, 40 x 80 feet. The new building will greatly facilitate the handling of their increased business.

The United States Wind Engine & Pump Company, Batavia, Ill., have purchased the old Van Nortwick paper mill, which adjoins their factory. The newly acquired plant, a large part of which they have occupied for several years, consists of several stone buildings of about equal dimensions. The main building is 208 x 45 feet and three stories high. Into the latter the company will put their steel tank department, which will occupy only part of one of the floors. Other departments will be moved as circumstances require.

The American Bridge Company will furnish the steel work for the ten-story office building to be built by the Mutual Savings Bank at the corner of Market and Geary streets, San Francisco, Cal.

The Pennsylvania Steel Company.—PHILADELPHIA, PA., January 23, 1901.—The Pennsylvania Railroad Company's directors at their board meeting to-day approved the plan for increasing the resources of the Pennsylvania Steel Company, and authorized the deposit with the Girard Trust Company of the stock of the Pennsylvania Steel Company belonging to the Pennsylvania Railroad Company in accordance with the plan sent to the stockholders by the president, E. C. Felton.

It is not too much to say that the death of Queen Victoria has plunged the world in mourning. Among all the tributes of admiration and respect to her memory as monarch and woman there is not one jarring note. Of all the historic personages who have passed away, none has left behind a deeper or more widespread regret than this greatly beloved and revered Queen. For close on two-thirds of a century she has filled the most conspicuous throne on earth in such a manner as to win universal homage. The loftiness of her character, the purity and beneficence of her influence and her wise and statesmanlike conduct in an exalted station made the Queen a great power for good and earned for her a world wide esteem and effection such as was never before commanded by any ruler. In the United States sorrow for her death is only less marked than among her own loyal subjects.

During 1900 the production of the Colorado Fuel & Iron Company was as follows, compared with 1899, the net ton being used throughout:

	1899.	1900.
Pig iron	107,928	132,738
Spiegel	4,692	4,194
Steel rails	80,470	120,350
Steel Plates	1,520	1,706
Merchant iron	31,971	27,738
Castings	8,443	11,131
Iron pipe	8,003	8,035
Spikes, bolts and nuts	9,306	8,071
Iron ore	247,771	269,853

The total production of coal in 1900 was 3,783,383 tons, while the tonnage of coke was 516,252 tons.

E. M. Shaw of Providence, R. I., dealer in steel castings, has contracted with the Fore River Engine Company of Weymouth, Mass., to furnish them with the hull and machinery castings to be used in the construction of the United States cruiser, "Des Moines," which he has placed with the Union Steel Casting Company, who are also furnishing the castings for the cruiser "Cleveland," building at the Bath Iron Works.

The Iron and Metal Trades.

The principal event of the week has been the closing of contracts for the sale of 100,000 tons of Bessemer Pig to the Carnegie Steel Company, at $12.50, Valley furnaces, to which a further lot of 50,000 tons will probably be added. Another large company have purchased 50,000 tons, but name a lower price, while other Pittsburgh interests have taken from 20,000 to 30,000 tons more. The deliveries run over the first half of the year. It is understood that in every case the Iron is needed to cover deficiency in the make of their own furnace plants.

Aside from the fact that these purchases indicate how heavily the Steel works are melting metal, they clear the situation in a branch in which there was most nervousness.

Whether there will be any labor trouble in the Valleys as threatened is doubtful. The impression prevails that work will go on quietly at the reduction offered by the furnace companies.

So far as Foundry Irons are concerned the market has shown further signs of weakness, notably in the Western distributing centers, the volume of business being fair.

The Steel Rail makers decided not to make the proposed advance last week. A good tonnage was booked, prominent among the orders being that of the Baltimore & Ohio Railroad for 45,000 tons, distributed to a number of different mills.

Chicago reports an export sale of 20,000 tons of Steel Rails and there have been reports in New York of some large inquiries from Russia, which, however, it has been impossible to trace to any reliable source.

The Billet makers have not changed prices but intimations are thrown out that there may be an advance of $1 per ton later on. It is reported that the tonnage being booked is increasing.

In the Plate trade the announcement is made that one large mill is in a position to make prompt and early delivery. The majority of the mills, however, are months behind. The placing of four very large boats with a Delaware shipyard holds out the promise of further large tonnage.

Among the large structural contracts placed is one of about 8000 tons for a bridge at Pittsburgh. A number of smaller orders have also been taken. Everything points to a very large consumption by the building trade this year.

The amount of municipal work, too, is likely to be large. The opinion is expressed in the Cast Iron Pipe trade that this will be the banner year for production.

The leading interest in the Wire industry reports that the volume of business is very large and that all the plants are running full.

So far as the exports of Iron and Steel are concerned, the reports of a number of the large producers indicate that a heavy falling off must be looked forward to. The unsettled financial condition in Great Britain and in Germany has cut off a large number of new enterprises, and inquiries, even for export, have almost disappeared. The letters of leading foreign producers received recently here are very blue as to the outlook.

In the Metal trades Copper is softening somewhat. What will probably need close watching is the German demand, which developed in such a phenomenal manner in recent years. The Zinc miners of the Joplin-Galena district propose to clear the atmosphere by heroic exports of Ore to Europe.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Jan. 23, 1901.	Jan. 16, 1901.	Dec. 26, 1900.	Jan. 24, 1900.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	$15 50	$15.50	$15.50	$22.75
Foundry Pig, No. 2, Southern, Cincinnati	*13.25*	13.25	13.75	20.25
Foundry Pig, No. 2, Local, Chicago.	*14.50*	14.75	15.00	23.50
Bessemer Pig, Pittsburgh	13.25	13.00	13.25	24.90
Gray Forge, Pittsburgh	*13.15*	13.15	13.25	21.50
Lake Superior Charcoal, Chicago	*18.50*	18.50	19.50	25.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	19.75	19.75	19.75	34.00
Steel Billets, Philadelphia	21.00	21.00	21.00	36.50
Steel Billets, Chicago	20.75	20.75	20.75	nom.
Wire Rods (delivered), nominal	**35.00**	35.00	33.00	nom.
Steel Rails, Heavy, Eastern Mill	26.00	26.00	26.00	35.60
Spikes, Tidewater	1.50	1.50	1.50	2.65
Splice Bars, Tidewater	1.35	1.35	1.35	2.30
OLD MATERIAL:				
O. Steel Rails, Chicago	**12.00**	12.00	11.00	17.00
O. Steel Rails, Philadelphia	*15.50*	15.00	16.00	21.50
O. Iron Rails, Chicago	**18.50**	18.50	17.50	25.00
O. Iron Rails, Philadelphia	18.00	18.00	18.00	26.00
O. Car Wheels, Chicago	**16.00**	16.00	15.00	21.00
O. Car Wheels, Philadelphia	17.00	17.00	17.00	20.50
Heavy Steel Scrap, Chicago	**12.00**	12.00	11.00	17.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.45	1.45	1.45	2.20
Common Iron Bars, Chicago	1.45	1.45	1.45	2.30
Common Iron Bars, Youngstown	1.30	1.30	1.30	2 15
Steel Bars, Tidewater	1.40	1.40	1.40	2.40
Steel Bars, Pittsburgh	1.25	1.25	1.25	2.20
Tank Plates, Tidewater	1.55	1.55	1.55	2.35
Tank Plates, Pittsburgh	1.40	1.40	1.40	2.20
Beams, Tidewater	1.65	1.65	1.65	2.40
Beams, Pittsburgh	1.50	1.50	1.50	2.25
Angles, Tidewater	1.55	1.55	1.55	2.40
Angles, Pittsburgh	1.40	1.40	1.40	2.25
Skelp, Grooved Iron, Pittsburgh	*1.45*	1.50	1.55	1 90
Skelp, Sheared Iron, Pittsburgh	*1 50*	1.55	1.60	2.30
Sheets, No. 27, Pittsburgh	2.85	2.85	2.85	2.90
Barb Wire, f.o.b. Pittsburgh	2.80	2.80	2.80	3.80
Wire Nails, f.o.b. Pittsburgh	2.20	2.20	2.20	3.20
Cut Nails, Mill	1.95	1.95	1.95	2.50
METALS:				
Copper, New York	*16.75*	16.87½	17.00	16.50
Spelter, St. Louis	*3.87½*	3.92½	4.00	4.55
Lead, New York	4.37½	4.37½	4.37½	4.70
Lead, St. Louis	*4 17½*	4.17½	4.20	4.65
Tin, New York	*27 00*	26.50	28.00	26.50
Antimony, Hallett, New York	9.25	9.25	9.25	9.75
Nickel, New York	55.00	55.00	55.00	38.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.84

Chicago. (*By Telegraph.*)

Office of *The Iron Age*, 1205 Fisher Building, CHICAGO, January 23, 1901.

The difference in the situation with respect to Finished Iron and Steel, as compared with Pig Iron, is more pronounced. While the demand for the former continues quite satisfactory and prices are decidedly firm, more weakness is shown in Pig Iron. Taking the entire market the outlook is still encouraging. Consumption of everything is on a large scale and buyers who are now holding back are expected to come into line before long, with the result of greatly increasing the volume of business. The improvement in general trade conditions is shown by the scarcity of factory buildings offered for rent in this city. It was not difficult, up to a few months back, to find almost any quantity of vacant property of this kind. Now renting agents are finding a demand which cannot be supplied, and it is expected that more activity in building factories will develop this spring than has been the case for many years.

Pig Iron.—The expected reduction in freight rates on Southern Pig Iron will not be made, as the railroad companies have decided not to change their rates. Ohio furnace companies, however, will receive the benefit of a reduction of 20c. in reaching this market after February 1. Transactions during the week have been limited. One sale of 2000 tons and a number of smaller sales are reported, but the aggregate was not large. A timid feeling has developed among buyers, who are now disposed to defer making contracts until either their necessities force them to enter the market or they become satisfied that prices will not recede much further. Quite a general reduction of 25c. per ton has been made on Foundry grades during the week. Quotations are as follows:

Lake Superior Charcoal	$18.50 to $19.00
Local Coke Foundry, No. 1	15.00 to 15.50
Local Coke Foundry, No. 2	14.50 to 15.00
Local Coke Foundry, No. 3	14.00 to 14.50
Local Scotch, No. 1	15.00 to 15.50
Ohio Strong Softeners, No. 1	16.00 to 16.25
Southern Silvery, according to Silicon.	15.50 to 16.00
Southern Coke, No. 1	14.85 to 15.35
Southern Coke, No. 2	14.35 to 14.85

Southern Coke, No. 3	13.85 to	14.35
Southern Coke, No. 1 Soft	14.85 to	15.35
Southern Coke, No. 2 Soft	14.35 to	14.85
Foundry Forge	13.35 to	13.85
Gray Forge and Mottled	13.35 to	13.85
Southern Charcoal Softeners, according to Silicon	15.00 to	17.00
Tennessee Silicon Pig	17.00 to	18.50
Alabama and Georgia Car Wheel	20.35 to	21.00
Malleable Bessemer	15.00 to	15.50
Standard Bessemer	15.00 to	15.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon	17.50 to	18.50

Bars.—A greatly increased business is reported. Orders are not only large but plentiful, representing all classes of consumers and all sections. Steel is in better demand than Iron and is therefore relatively firmer, but the Iron situation is also growing stronger. The large manufacturers of Soft Steel bars are so well sold up for the next three or four months that excellent orders are being turned down because of inability to make deliveries. Those who are still able to take business are in very few cases willing to enter contracts running beyond March. Mill shipments of Common Iron are quoted at 1.45c. to 1.50c.; Soft Steel Bars, 1.40c. to 1.45c., and Hoops, 1.95c., base, Chicago. Jobbers are having a very good demand for stock, but are getting somewhat anxious over the backwardness of the mills in making deliveries. Their stocks are being drawn upon to meet a demand which would ordinarily be filled by direct shipments from the mills. Prices of small lots are continued at 1.75c. to 1.80c. for Common Iron; 1.60c. to 1.75c. for Steel Bars, and 2c. to 2.20c. for Hoops.

Structural Material.—Figures are now being made on office buildings in this city to take an aggregate of 4000 tons. The demand for small lots to meet current requirements continues quite good, and the daily business entered in this way reaches a satisfactory tonnage. The car building interests are not only steady buyers of material, but are specifying heavily against contracts previously made. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.65c.; 18 inches and over, 1.75c.; Angles, 3 inches and over, 1.55c.; Angles, under 3 inches, 1.55c. rates; Tees, 1.70c.; Universal Plates, 1.55c. to 1.60c. Small lots of Beams and Channels from local yards are quoted at 2.10c. to 2.25c.; Angles, 1.60c. to 1.70c. rates, and Tees, 1.75c. to 1.85c.

Plates.—While less talk is heard of advancing prices the situation is reported very encouraging by manufacturers. The leading mills are sold up far into the future, the largest makers having their output engaged up to September. The local mill is well supplied with work for the next three or four months. A few manufacturers are able to make fairly prompt delivery, but are holding prices firmly. The consumers of Plates are using increasing quantities. Shops are being equipped with more heavy machinery and are greatly extending their business. Dealers in boiler makers' equipment have seldom had more business in their line than they have recently been enjoying. Western boiler makers are taking considerable export trade. The demand for Plates from stock is up to the average for the season. Mill shipments of Tank Plate, ¼-inch and heavier, in carload lots, are quoted at 1.55c. to 1.60c., Chicago; Flange, 1.65c.; Marine, 1.75c.. Jobbers quote small lots from store at 1.80c. to 2c. for Tank, and 2.10c. to 2.25c. for Flange.

Sheets.—Manufacturers are still booking good orders for both Black and Galvanized Sheets. The activity in mill business has now continued for nearly three months, which is phenomenal for the time of the year. Jobbers likewise report a very good trade, with shipments still being made from local stocks to numerous Western points. Mill shipments of No. 27 Black are quoted at 3.15c., Chicago, while Galvanized Sheets are held at 70 and 7½ off. Small lots from stock are quoted at 3.30c. to 3.40c. for No. 27 Black, 2.40c. for No. 16, 2.30c. for No. 14, 2.10c. for No. 12, 2c. for Blue Annealed No. 10, and 70 off for Galvanized.

Merchant Pipe.—Nothing new has developed. The demand continues fairly good and prices are maintained, although a new schedule is expected soon. Manufacturers' prices, random lengths, are as follows:

	In carloads.		Less than carloads.	
	Blk.	Galvd.	Blk.	Galvd.
⅛ to ½ inch and 11 to 12 inches	59.2	46.2	54.9	40.9
¾ to 10 inches	66.7	53.3	61.9	49.9

A steady demand is experienced for Boiler Tubes, little change in the volume of business being noted from week to week. We quote as follows:

	Steel.	Iron.
1 to 2¼ inches, inclusive	50	40
2½ inches	50	42½
2¾ to 5 inches	60	50

Rails and Track Supplies.—The tonnage covered by sales of Heavy Sections of Steel Rails has not been large since last report, but negotiations are pending on a great deal of business. The export demand is good, sales being made quite frequently on this account, including both Heavy and Light Sections. A 20,000 ton sale of Heavy Sections has been made for export and an inquiry for 3000 tons of Light Sections, also for export, has been received. Prices are continued at $26 for Heavy Sections, and $25.50 to $28 for Light Sections, according to weight. A continued large business is being done in Track Supplies. Splice Bars are quoted at 1.40c. for moderate quantities with concessions on large lots. Spikes are moving at 1.65c. for large lots, but small quantities command a much higher price. Track Bolts, with Hexagon Nuts, are slightly dearer, being now quoted at 2.60c., while Square Nuts are unchanged at 2.40c.

Billets.—No business is reported in Bessemer Billets, but Open Hearth Billets continue to be in good demand in small quantities. They are quoted in carload lots at $23.75, and in small lots from store at $28, upward.

Merchant Steel.—Very little new business has come up during the week, but full specifications are being received against contracts, and consumers are asking for shipments to be rushed as rapidly as possible. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.75c. to 1.90c.; Smooth Finished Tire, 1.75c. to 1.95c.; Open Hearth Spring Steel, 2.15c to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.70c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off. Ordinary grades of Crucible Tool Steel are quoted at 6c. for carloads and 7c. from store; Specials, 13c. upward.

Old Material.—Offerings have increased very considerably and the condition of the market has changed to weakness. Consumers are now holding back, waiting for lower prices. The following are approximate quotations per gross ton:

Old Iron Rails	$18.50 to $19.00
Old Steel Rails, mixed lengths	12.00 to 12.50
Old Steel Rails, long lengths	14.00 to 14.50
Heavy Relaying Rails	20.00 to 22.00
Old Car Wheels	16.00 to 16.50
Heavy Melting Steel Scrap	12.00 to 12.50
Mixed Steel	9.50 to 10.00
No. 1 Mill	10.50 to 11.00
No. 2 Mill	9.00 to 9.50
No. 1 Busheling	8.50 to 9.00
No. 2 Busheling	7.50 to 8.00

The following quotations are per net ton:

Iron Fish Plates	$16.00 to $16.50
Iron Car Axles	18.50 to 19.00
Steel Car Axles	15.00 to 15.50
No. 1 Railroad Wrought	14.00 to 14.50
No. 2 Railroad Wrought	12.00 to 12.50
Shafting	15.00 to 16.00
No. 1 Dealers' Forge	11.00 to 11.50
No. 1 Country Wrought	9.00 to 10.00
Iron Axle Turnings	9.00 to 9.50
Soft Steel Axle Turnings	8.00 to 8.50
Machine Shop Turnings	7.00 to 7.50
Wrought Drillings	5.00 to 5.50
Cast Borings	3.00 to 3.50
Mixed Borings, &c	4.00 to 4.50
No. 1 Boilers, cut	9.00 to 9.50
No. 2 Boilers, cut	7.50 to 8.00
Boiler and Ship Scrap	8.00 to 8.50
Heavy Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	8.50 to 9.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	10.50 to 11.00

Metals.—Carload lots of Lake Superior Copper are unchanged at 17½c. and Casting brands at 17¼c. Pig Lead is quiet, with Desilverized held at 4.32½c., and Corroding 4.42½c., in 50-ton lots. The consumers of Lead are having a very heavy demand for their products and it is expected that the large volume of their business must shortly cause an improved movement in the crude article.

Coke.—Dealers report a continued excellent demand. Foundry coke is unchanged at $4.50 to $5 for 72-hour Coke.

A natural gas well has been struck at Alum Rock Park, near San Jose, Cal.

Philadelphia.

Office of *The Iron Age*, Forrest Building, PHILADELPHIA, PA., January 22, 1901.

The week in the Iron market has been wonderfully strong, considering the adverse influences it has had to contend with. Rumors of competition and general disaster has been predicted by manipulators in the stock market, but business goes on just the same, no decline in prices, and no evidences are shown of oversupply, nor of any danger of such a thing in the immediate future. Deliveries are as hard to secure as at any time for weeks past, particularly as regards Pig Iron, Billets, Structural Material and Sheets. This may be all changed three or four months hence, but in the meanwhile makers and sellers, as well as consumers, of Iron continue the even tenor of their way, and are not in the least disturbed by Stock Exchange movements. The one fact that is clear to everybody is that there is plenty of business, and so far as can be seen it is more likely to increase than to decrease as the winter months pass away. Manufacturers of Iron and Steel are finding themselves considerably behind with their orders, and as it will take some time to catch up, they are not disposed to take pessimistic views until there is some better reason for doing so than there appears to be at the present time. At the same time it must be said that buyers are very conservative and are not inclined to make long contracts until the outlook is more settled in regard to production, &c.

Pig Iron.—There is little or no change to report in the Pig Iron situation. Prices are firm, but the demand is not active, although deliveries are being made on an unusually large scale. Some sales are being made in good sized lots, and buyers appear to be on the look out for special grades, such as Basic and other Irons that can be had at from $13.75 up to about $14.50. Several large sales of such grades have been made at the figures named, and others could be made if the terms and conditions could be met. Foundry grades are in fair demand, with sales chiefly at $15 to $15.25 for No. 2 Plain, and $15.75 to $16 for No. 2 X. At these figures there is no great snap, but the Iron is taken in sufficient quantity to prevent accumulations, so that prices are maintained, although it is a question whether they will not yield a little if January again shows a large increase in the furnace output. The undertone of strength is very surprising, however, considering all the surroundings, and there is certainly nothing in the immediate outlook to indicate a weak market, the range of prices for seaboard and nearby deliveries being about as follows: No. 1 X Foundry, $16 to $16.50; No. 2 X Foundry, $15.50 to $16; No. 2 Plain, $15 to $15.25; Standard Gray Forge, $14.50 to $15; Ordinary Gray Forge, $14 to $14.25; Basic (Chilled), $14.75 to $15; Basic (Sand), $14 to $14.25.

Billets.—It is a curious fact that, with all the mutterings about prices being too high, there is a veritable scarcity of Steel for prompt delivery, and even for deliveries at fairly long dates sellers are not at all anxious to enter large orders. Several large consumers in this vicinity are greatly inconvenienced by the difficulty in securing deliveries, and they can get no definite promises of relief during the next two or three weeks. Prices for Bessemer $21, and $22 for Open Hearth Steel.

Plates.—There is no large amount of new business around at the present time, but prices are very firm, and the mills have plenty of work to go on with. Options that are out for large quantities are expected to be taken up in the near future, so that manufacturers are not uneasy because of a temporary dullness. Prices therefore remain as last quoted, viz.: Plates, ¼-inch and thicker, 1.55c. to 1.60c.; Universals, 1.55c. to 1.60c.; Flange, 1.65c. to 1.75c.; Charcoal Iron Plates, C. H. No. 1, 2.25c.; Best Flange, 2.75c.; Fire Box, 3.25c.

Structural Material.—There is a good demand and deliveries are in many cases still very much delayed, owing to excessive calls for prompt shipments. Prospects for continued activity are as favorable as ever, so that there is no anxiety except to place orders under guarantee of deliveries at dates specified. Prices as last quoted: Angles, 3-inch and upward, 1.65c. to 1.75c.; less than 3-inch, 1.50c. to 1.60.; Beams and Channels, 15-inch and upward, 1.65c. to 1.75c.

Bars.—The Bar trade is rather quiet, and there is some pressure to secure good sized orders for deliveries in the near future. There is no immediate scarcity of work, but orders are thinning down, and the outlook in this line is not as promising as in some others. Prices are easy about as follows (but liable to be shaded on desirable business), for city or nearby deliveries: Refined Iron Bars, 1.45c. to 1.55c.; Steel Bars, 1.40c. to 1.50c.

Sheets.—The demand is very satisfactory, all the various numbers being taken in large volume. Prices firm and unchanged as follows for best Sheets (common Sheets two-tenths less): No. 10, 2.25c.; No. 14, 2.45c.; No. 16, 2.65c.; Nos. 18-20, 3.15c.; Nos. 21-24, 3.25c.; Nos. 26, 27, 3.30c.; No. 28, 3.45c. to 3.50c.

Old Material.—The demand is somewhat irregular, but the general tendency appears to be toward slightly higher prices. Bids and offers for deliveries in buyers' yards are about as follows: Choice Railroad Scrap, $18 to $19; No. 1 Yard Scrap, $13 to $14; No. 2 Light Scrap, $11.50 to $12.50; Machinery Cast, $14.50 to $15; Heavy Steel Scrap, $14.75 to $15.50; Old Iron Rails, $18 to $19; Old Steel Rails, $15.50 to $16; Wrought Turnings, $10 to $10.50; Cast Borings, $8 to $8.25; Old Car Wheels, $17 to $18; Iron Axles, $20 to $22; Steel Axles, $17 to $18.

Cleveland.

CLEVELAND, OHIO, January 22, 1901.

Iron Ore.—Since the discussion of possible future prices on Iron Ore was opened it has been supposed that a meeting of the Ore Association would be held in Cleveland during the present week. All inquiries produce the same reply, that no meeting has been called and so far no time has been discussed. The association practically consists of nine men in this city, many of whom are now away. Small labor troubles broke out along the docks this week which threatened to hamper the shipment of the commodity to the stock piles of the furnaces. While the questions raised have not been settled it is believed now that the dissatisfaction has been confined to Cleveland, whereas it at first threatened to be extended all along the south shore of Lake Erie.

Pig Iron.—The week has been comparatively quiet in Pig Iron affairs. Merchant furnaces have been doing a peddling business, getting rid of small orders from time to time, but selling no large amounts of material. The indications are brighter than they have been, leading to the belief that by the middle of February conditions will again have assumed entirely normal shape, if indeed the business is not larger than has been seen for better than half a year. One indication is hopeful, the consumers are now applying on orders in excess of what was stipulated in their contracts, the consumption therefore being larger than was expected. The furnaces are in splendid shape for deliveries, being able to offer to deliver on orders within two weeks, in most instances. It seems now that a strike of the workmen at the Valley furnaces is unavoidable. The men have asked for an advance of 10 per cent. in the wages. The furnacemen had provided a reduction of 15 per cent. No settlement is in sight and it is altogether possible that after February 1 all of the furnaces in the Valley will be shut down. This will be extremely annoying to the combination furnaces, but it is taken as a hopeful sign by the merchant furnaces, which are looking for better markets as a result. They expect to dispose of the residue of their stock piles to the big concerns before the strike is declared off. Nothing has been done so far by the Bessemer Association as to starting their furnaces. Comparatively few of them are now in blast and the others will remain idle for the time being, and it may be until the labor difficulties in the Valley are cleared up. Prices are firm for immediate shipment, or for orders covering shipment during the first half of the year. The following prices are quoted: No. 1 Foundry, $14; No. 2 Foundry, $13.50, Valley furnace; Basic, $13.50; off Basic, $12; Bessemer, $13.50, nominal.

Finished Material.—Something akin to a sensation was sprung this week by the announcement of the Otis mills that they were able to make deliveries in Plates within ten days or two weeks. The Federal Steel Com-

pany are unable to make deliveries much short of five months, and Carnegies are even worse off, having their capacity covered for six months or better. The Otis and some of the other mills refused to take Plate at prevailing market quotations when the boom was on, believing that better prices were in sight. The other mills figured that the prospects for even prices were good and took everything that was ordered. Some of the smaller mills are therefore looking for business and are picking up a good deal of it, in small quantities. The Plate sales are confined now to bridge work and to ship material, the American Ship Building Company continuing a heavy buyer, because of four new boats recently ordered, two of which are to be built here in sections and sent to the Atlantic Coast to be spliced at St. Lawrence River points. The Rail market is still active, something like 13,000 tons having been sold this week. There is an additional inquiry for 15,000 tons more that will be closed this week. On the sales for this week 10,000 tons were for electric lines and the remaining 3000 went to a steam line. Building material is still being sold in large quantities although the transactions have not been as heavy as they promise to be when the building season opens in the early spring. A great many inquiries are now being made, but whether these will develop into sales is purely conjectural. The Nickel Plate Railroad has decided to build several new bridges the Steel for which will be purchased in a short time. The capacity of the mills on Bar Iron is sold up very largely, hence there is but little activity in that quarter. Billets are of little interest, the mills using most of their product. The prices have not changed, being quoted as follows: Rails, $26; Plates, 1.50c., Cleveland; Bars, 1.35c., Pittsburgh; Beams and Channels, 1.50c., Pittsburgh; Angles, 1.40c., Pittsburgh; Billets, $19.75, Pittsburgh.

Old Iron.—The conditions surrounding the Scrap trade are more settled than they have been since the beginning of the holidays. The business is still light, but the prospects are brighter. Prices have settled temporarily upon the following basis: No. 1 Wrought, $15 net; Cast Scrap, $13 net; Stove Plate, $10 net; Old Car Wheels, $17.50 gross; Cast Iron Borings, $5.75 net; Wrought Turnings, $9 net; Heavy Steel, $13.50 gross.

Cincinnati. *(By Telegraph.)*

Office of *The Iron Age*, Fifth and Main streets, Cincinnati, January 23, 1901.

Despite the fact that the Pig Iron market is very irregular as to quotations, it shows a degree of steadiness which is somewhat surprising under the circumstances. There has been quite a good lot of Iron sold, a few orders for round lots, but in the main moderate quantities. The amount of contradiction existing in regard to the figures at which Iron is being sold is simply amazing and it is almost impossible to arrive at anything like accurate figures. There are some authorities who dispute the correctness of the minimum quotations given in last week's *Iron Age*, and others who show proof that the basis then quoted was a fairly correct representation of selling values. A few lots of irregular Iron have been sold at prices still lower than those quoted, but in the main there has been but very little change in the past seven days. A little No. 2 Southern Foundry has been sold on the basis of $10.50, Birmingham, but the majority of offerings is at a higher figure. About the only Southern Iron which has been selling is Nos. 3 and 4 Foundry and a little Forge. Most of the Iron sold in the territory tributary to Cincinnati from the North has been Northern stock, and this at 25c. to 50c. below the quotations of a week ago. There is no indication that the reduced prices have upset the market to any material degree, however, and a fair, steady trade is confidently expected. There are a few buyers in the market for something like round lots of Iron, but in the main the trading will be in moderate sized quantities. Freight rate from Birmingham is $2.75 to this point; from Hanging Rock district, $1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$14.00 to $14.25
Southern Coke, No. 2	13.25 to 13.50
Southern Coke, No. 3	12.50 to 13.00
Southern Coke, No. 4	12.25 to 12.50
Southern Coke, No. 1 Soft	14.00 to 14.25
Southern Coke, No. 2 Soft	13.25 to 13.50
Southern Coke, Gray Forge	12.00 to 12.25
Southern Coke, Mottled	12.00 to 12.25
Ohio Silvery, No. 1	17.00 to 17.50
Ohio Silvery, No. 2	16.00 to 16.50
Lake Superior Coke, No. 1	15.50 to 16.00
Lake Superior Coke, No. 2	14.50 to 15.00
Lake Superior Coke, No. 3	13.50 to 14.00
Southern Basic	.... to 14.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	$18.75 to $19.75
Standard Southern Car Wheel, No. 2	17.75 to 18.75
Lake Superior Car Wheel and Malleable	19.00 to 20.00

Plates and Bars.—The market on Plates and Sheets is steady and reasonably active. Bars have been very quiet in this market and there is a weak, uncertain feeling in regard to them which makes prediction rather difficult. There are reports of some lots being sold at a cut on the recognized quotations, but no authority exists to reduce the figure as yet. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.45c., half extras; in small lots, 1.75c., with full extras; Steel Bars, in carload lots, 1.40c., with half Steel card extras; Base Angles, in carload lots, 1.50c. to 1.55c.; Plates, 1.55c. for ¼-inch and heavier; Sheets, No. 1, 1.95c.

Old Material.—The situation here is unchanged. A fair, steady business and quotations remaining about on the same basis as they were. Dealers' buying prices per gross ton are, f.o.b. Cincinnati: No. 1 Wrought Railroad Scrap, $15; Cast Railroad and Machinery Scrap, $11; Old Iron Axles, $16.75; Iron Rails, $18; Steel Rails, rolling mill lengths, $13; short lengths, $12; Car Wheels, $15.

St. Louis. *(By Telegraph.)*

Office of *The Iron Age*, 1205 Chemical Building, St. Louis, January 23, 1901.

Pig Iron.—Quite a good lot of orders for Pig Iron were booked since last report. One order was for 500 tons, but the remainder were for carloads and running up to 100 tons. Business is by no means rushing, but that which is taking place gives promise of the trade's nearby necessities. For the present no eagerness to cover prospective wants is displayed by foundrymen. Local foundries are doing a good, steady business and seem to be in excellent shape. Inquiry keeps up nicely, the tonnage, however, being rather light. Concerning prices, it may be said that the large companies are holding stiffly to $11.25, Birmingham, for No. 2, but it is also reported that somebody is getting orders on basis of prices below. We quote, f.o.b. St. Louis:

Southern, No. 1 Foundry	$14.50 to $14.75
Southern, No. 2 Foundry	13.75 to 14.00
Southern, No. 3 Foundry	13.25 to 13.50
No. 1 Soft	14.50 to 14.75
No. 2 Soft	13.75 to 14.00
Gray Forge	12.50 to 12.75

Bars.—Some of the mills are out of the market on Steel Bars and cannot take new business for delivery under six weeks. It is still possible to get reasonably prompt shipments from other makers. Specifications on contracts placed just after the election are coming forward very nicely, and at the same time there is a free receipt of new orders, which are governed by present prices. Taking it all around, the demand is pressing the supply rather closely. Mill prices for both Iron and Steel in heavy tonnage are 1.45c. to 1.50c., half extras, East St. Louis. Jobbers' price on less than carloads is 1.75c. to 2c., full extras.

Rails and Track Supplies.—The market shows no change. Inquiry is fair, but actual results are somewhat light. Track Supplies are in good movement at a slight change in price of Bolts. We quote Splice Bars, 1.50c. to 2c.; Bolts, with Square Nuts, 2.20c. to 2.30c.; with Hexagon Nuts, 2.30c. to 2.40c.; Spikes, 1.70c. to 1.80c.

Pig Lead.—Next to dull. All Missouri brands now quoted at 4.17½c.; Desilverized, 4.32½c. That Missouri Lead continues weak is evidence that the supply exceeds demand. Lead Ore remained at $46 per ton.

Spelter.—Market is quiet and orders limited. Price easier, at 3.87½c. The rumor that Joplin parties are arranging to make export shipments of Ore covering extensive tonnage is said to be well founded. On account of extremely low prices now ruling, only favored mines are running. The product is therefore in fewer

hands, and it is claimed more concerted action can be taken to get better results for miners. The average selling price is close to $24 per ton. Holders of better grades are asking more than smelters can pay, considering present price of Spelter. Top price is mentioned as $26.50.

Donk Bros. Coal & Coke Company, St. Louis, Pig Iron and Coke agents and miners of Coal, are now in handsome offices in the new Stock Exchange Building. The sales offices are on the street floor, the clerical department, directors' room and engineer's office occupying the entire second floor.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, January 23, 1901.

(By Telegraph.)

Pig Iron.—The Carnegie Steel Company came in the market in the last few days and have bought from the Bessemer Furnace Association 100,000 tons of Standard Bessemer Pig Iron, and have asked to have the quantity increased to 150,000 tons, all for delivery this side of July. The Bessemer Furnace Association is holding a meeting in Cleveland to-day (Wednesday) to take action on the other 50,000 tons, and there is no doubt that the Iron will be sold to the Carnegie Steel Company, making the total purchase of that concern 150,000 tons, the price being $12.50 at furnace, to which the new lower freight rate of 75c. makes the price $13.25, delivered Pittsburgh. This is the largest single purchase of Bessemer Iron made by the Carnegie Steel Company for several years, and is the first Iron that concern have bought for some time. The purchase of such a large tonnage means that all the surplus Iron in the two Valleys owned by furnaces belonging to the Bessemer Furnace Association has been cleaned up and that a good part of the output of the furnaces up to July is also taken care of. We may state that none of the large Steel interests, like National Steel Company, American Steel Hoop Company and others, are selling Iron, but all these concerns are using all the Iron they make in their own Steel works. The Pig Iron situation has been vastly improved by this purchase, and the outlook for the first half of the year at least is very much better. While the furnaces are still paying the same scale of wages as was in force when Iron was $24, they have taken contracts for this large tonnage, believing that their request made to the men for a reduction in wages of 15 per cent., effective February 1, will be granted. It will be recalled that the furnace employees met in Youngstown last week and decided to refuse to accept the reduction, and made a counter demand for an advance of 10 per cent. It is not believed, however, that this demand will be insisted upon, for the reason that already the furnace employees have agreed to submit the matter to arbitration. It is very likely a settlement of the matter will be made prior to February 1, and that no strike will occur. The Iron which the Carnegie Steel Company bought is for their own needs, and will go into consumption in their Steel plants as fast as received. Other large Steel interests have bought from 50,000 to 60,000 tons, a local Steel plant taking some 20,000 to 30,000 tons. In all there has been sold this month more than 200,000 tons of Bessemer Iron, the best month's business for a long time, prices ranging all the way from $12 at Valley furnace up to $12.50. The absolute minimum of the market to-day is $12.50 at furnace. There is a fair movement in Forge Iron and prices range from $13 to $13.10, Pittsburgh. Foundry Iron is somewhat quiet and some low prices are being made. We quote Bessemer $12.50, Valley furnace, $13.25 Pittsburgh; Gray Forge, $13 to $13.10; No. 2 Foundry, $14 to $14.25. We note a sale of 1500 tons of Gray Forge on the basis of $13, Pittsburgh; also 100 tons of No. 2 Foundry Iron, of a special brand, at $14.40, Pittsburgh.

Billets.—The Edgar Thomson mill at Bessemer has not gone on Billets, as reported. We are advised that the tonnage in Steel being sold by the mills at pool prices is increasing, and is fairly satisfactory from the standpoint of the Steel makers. The report is again current that the price of Billets will be advanced $1 a ton February 1. We quote Bessemer Billets, Pittsburgh, Wheeling and the Valleys, at $19.75, delivered. Billets smaller than 3⅞ inches are $1 extra. Carbons higher than 0.21 and up to 0.60 are $1 extra; 0.61 up to 1 are $2 extra. Basic Open Hearth Steel, $1 a ton extra over the price of Bessemer. For cutting small Billets, 50c. per ton extra.

Sheet and Tin Bars.—There is a heavy demand for Sheet and Tin Bars, owing to active conditions of the Sheet and Tin Plate trade. We quote Sheet and Tin Bars at $20.75, delivered, Pittsburgh, Wheeling and Valley districts. For cutting Sheet and Tin Bars, 50c. per ton extra.

Muck Bars.—The market is very dull, and we quote nominally at $24.50, Pittsburgh, for February shipment. Probably lower prices will be named on account of the lower freights.

Structural Material.—Some big jobs are being given out. Yesterday (Tuesday) the American Bridge Company took the Fort Wayne Railroad bridge, Eleventh street, Pittsburgh, involving 8000 tons. This job has been hanging fire for some time. The same company have taken the American Car & Foundry Company buildings at Detroit, calling for 2500 tons, and a Steel bridge for the Cambria Steel Company, at Johnstown, calling for 500 tons.

(By Mail.)

Rumors of important deals among the large Steel interests, and the denials of them, are the principal topics of interest in the trade at this time. There seems to be no doubt whatever but that negotiations are on foot for some important changes in the Steel trade. It is probable that if a proposition was made to Mr. Carnegie, satisfactory to him as regards price and conditions, he would be willing to retire and devote the principal part of his future life and fortune in the furtherance of his philanthropic plans. Mr. Carnegie no doubt had this in mind at the time he gave an option on his holdings in the Carnegie Steel Company to Henry C. Frick. It may be stated, however, that as yet nothing definite has been done, but a deal whereby Mr. Carnegie would surrender control of the Carnegie Steel Company into new hands would not be surprising to the trade.

The reduction in freights on Iron and Steel, to go into effect on February 1, and the further reductions in Ores and Coke, which are now being talked of, and which will no doubt be made, are probably having the effect of holding back new tonnage, from the fact that there is a lull in new business, and were it not for large contracts booked some time since some of the mills would be scarce of work.

Here and there weak spots have appeared on lines not controlled by price agreements. A material improvement in business is expected along in February, when the new lower freight rates go into effect. There is no lack of work among the mills in spite of light demand, as old contracts will take available capacity for several months to come.

Structural Material.—It is believed that 1901 will be a banner year in building operations, and demand for Structural Material is expected to be heavier this year than in any one year in the history of the trade. Already some large contracts have been booked for 1901 delivery, and other large jobs are pending. The contract for the Frick office building was placed last week, and it will require 6000 to 7000 tons of material. This, however, has not yet been given out. A good deal of bridge work is in sight, and the American Bridge Company are operating all their plants to utmost capacity. There probably never was a time in the history of the Structural trade when demand and outlook were so good as at the present time. There has been no change in prices, and we quote: Beams and Channels, up to 15-inch, 1.50c.; over 15-inch, 1.60c.; Angles, 3 to 6 inches, inclusive, 1.40c.; over 6 inches, 1.50c.; under 3 inches, 1.25c.; Zees, 1.50c.; Tees, 1.55c.; Steel Bars, 1.25c. to 1.35c., half extras, at mill; Universal and Sheared Plates, 1.40c., all f.o.b. Pittsburgh.

Bars.—There is a moderate amount of new business being placed, but the mills are running mostly on contracts taken some time since. The large consumers are pretty well covered and are not in the market. We

quote Steel Bars at 1.25c. at mill in carloads and 1.30c. to 1.35c. in small lots. Iron Bars are 1.30c., Valley, equal to 1.34½c., Pittsburgh, in carloads.

Plates.—While tonnage being placed in Plates is not as large as some time ago, yet the situation is very strong, and it is possible a slight advance in prices may be made before long. As noted some time since, the Carbon Steel Company of this city have taken a contract for a large amount of Steel to be used in making cable wires for the East River Bridge. This material was formerly furnished by Swedish mills. Prices on Plates are unchanged, and we quote: Tank quality, ¼-inch and heavier, 1.40c.; 3-16-inch, 1.45c.; under 3-16-inch and above No. 10, 1.50c.; Flange or Boiler Steel, 0.1c. advance over base of Tank; Marine and Fire Box, American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

Steel Rails.—The report that the Edgar Thomson mill of the Carnegie Steel Company had been put on Billets is, we are advised, untrue, and the plant is running on Rails. The Rail mills held a meeting in New York last week, but made no change in prices. It is stated that the mills have booked about 1,500,000 tons of Rails for this year delivery. We quote at $26 at mill.

Merchant Steel.—There is a fair demand, but mostly for small lots. Specifications on old contracts are coming in very freely. As before noted, prices on Cold Drawn and Cold Rolled Shafting have been advanced to 55 per cent. off in carloads and 50 per cent. off in less than carloads, delivered in base territory. We quote: Plow Slabs, ¼-inch and heavier, at 1.60c., base; Tire Steel, 1.35c. to 1.40c.; Toe Calk, 1.70c. to 1.75c.; Open Hearth Machinery, 2c., base; Open Hearth Spring, 2c., base; Hammered Lay Steel, 3c. to 3.25c.; Rolled Lay Steel, 2.75c. to 3c.; Cold Rolled Shafting, 55 per cent. off in carload lots; 50 per cent. in less than carload lots, delivered in base territory. Tool Steel, 7c. and upward, according to quality. On Tool Steel freight is allowed east of the Mississippi River.

Sheets.—There is a heavy demand for Sheets, and most of the mills are sold up anywhere from six weeks to three months ahead. The leading interest are operating all their Sheet mills to full capacity. Prices are very firm, and we quote: No. 27 Black Sheets, 2.85c. to 2.90c.; No. 28, 2.90c. to 2.95c. We quote Galvanized Sheets at 70, 10 and 5 per cent. off, f.o.b. at mill.

Skelp.—The market is dull and prices are lower. We quote Grooved Iron Skelp at 1.45c. and Sheared at 1.50c. to 1.55c. We quote Grooved Steel Skelp at 1.30c. and Sheared at 1.35c. to 1.40c., Pittsburgh; terms 4 months, or 2 per cent. off for cash in 30 days.

Pipes and Tubes.—The heavy strike of oil in Texas by the J. M. Guffey interests has caused a heavy demand for oil well supplies, and it is estimated that Pittsburgh manufacturers have sent out fully 100 cars of material to the new field. Included in this was 15 miles of 6-inch Pipe. Tonnage in Tubular Goods is holding up very well and prices are firm, being shaded only in exceptional cases and on certain sizes. There are no new developments in the proposed new Carnegie Tube plant at Conneaut. Plans call for six butt weld and 18 lap weld furnaces. Consumers in carload lots are quoted as follows:

Merchant Pipe.

	Black. Per cent.	Galvd. Per cent.
⅛ to ½ inch and 11 to 12 inch	61	48
⅝ to 10 inch	68½	56

Casing, Random Lengths.

	S. & S.	I. J.
2 to 3 inch	58	53½
3¼ to 4 inch	63	59
4¼ to 12½ inch	65	61½

Casing, Cut Lengths.

	S. & S.	I. J.
2 to 3 inch	53½	49
3¼ to 4 inch	59	55
4¼ to 12½ inch	61½	57½

Boiler Tubes.

	Up to 22 feet. Per cent.
Steel.	
1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive	68½
2 inch to 2½ inch, inclusive	63
6 inch and larger	62
Iron.	
1 inch to 1½ inch and 2½ inch	49½
1¾ inch to 2¼ inch	45
2¾ inch to 13 inch	57

Jobbers are quoted 5 per cent. or more lower than the above prices.

Coke.—Last week there were 16,696 ovens in the Connellsville region active and 4227 idle, the output having been 194,675 tons, the largest weekly output for some months. For the past six weeks or two months the output has been increasing, and it is expected will soon exceed 200,000 tons per week. We quote strictly Connellsville Furnace Coke at $1.75 a ton, but main line Coke, made outside the Connellsville region, is being offered as low as $1.50 to $1.60 a ton. This Coke, however, does not compare in quality with Connellsville. Strictly Connellsville Foundry Coke is held at $2.25 a ton, but outside brands are offered at $2 or lower. Connellsville Crushed Coke is held at $2.25 to $2.50 a ton, but outside brands are being offered at lower prices.

Iron and Steel Scrap.—There is nothing of special interest to note. The Scrap market continues quiet, and there is a good deal of range in prices being offered by consumers and those made by dealers. We quote: No. 1 Railroad Wrought Scrap, $14.50 net ton, f.o.b. Pittsburgh; Old Iron Rails, $18.50 to $19, Pittsburgh, and $19.50, Valley, gross ton; Old Steel Rails, $14 to $14.50 gross ton; Busheling Scrap, $12 gross ton; Turnings, $7 net ton; Cast Iron Borings, $6 net ton; Old Horseshoes, $13 gross ton; Heavy Melting Stock, $13 to $13.50 gross ton.

The offices of the Sharon Steel Hoop Company have been removed from Lewis Building, Pittsburgh, to the works, at Sharon, Pa. Work on the building of the new plant of this concern is being pushed rapidly, and they expect to be in the market in May or June with Hoops and Bands.

The Liberty Construction Company have opened offices on the fourth floor of the Empire Building, Fifth and Liberty streets, Pittsburgh.

Birmingham.

BIRMINGHAM, ALA., January 21, 1901.

Large buyers were feeling the market the past week but the majority completed no business. The number and the volume of inquiries increased over the preceding week, but the volume of business did not increase proportionally. The manufacturers of Agricultural Implements were inquirers after prices and one prominent interest took a respectable lot at prices that are withheld. It is stated by the knowing ones that the sale was at a concession in price. Sometimes the buyer gets the benefit of a freight contract and in giving it to him the seller can preserve his quotations. You can find no one who will plead guilty to granting concessions in prices, but there is a quasi admission as to special freight contracts at figures under tariff rate. Some buyers got the advantage of these contracts. No. 2 Foundry is quoted at $11 still, with one interest holding at $11.50 and indifferent to orders, as their total stock in yards is only 1200 tons. No. 3 Foundry should be $10.50, but it looks as if $10.25 could secure a respectable lot. No. 2 Soft is yet $11, and anything but plentiful. No. 4 Foundry and Gray Forge are difficult to quote correctly. Some cull these grades closer than the other interests and make a grade difference in price. For instance, one interest will quote you Gray Forge at $9 and No. 4 Foundry at $9.50, while another interest will quote both grades at $9.50, and from some you cannot buy at less price. On Basic Iron the situation is unchanged. The Tennessee Company now have four furnaces exclusively making that grade, and it will be months before their output will complete contracts already booked. It is stated with every semblance of authority that all interests in the furnace at Talladega have been centered in a New York firm of bankers and that it will be put in operation forthwith. The Woodstock furnaces at Anniston, it is

stated, have received such orders as indicate a resumption of business there as soon as they can be made ready. The Charcoal furnace at Jenifer is to be changed into a Coke furnace at an early date. This, on the face of it, means increased production, but the element of time must be considered, and it will be months before their combined output will figure in reports.

The business of the Steel mill continues as heretofore represented. Lately one shipment of 2000 tons was made direct to Glasgow, and a largely increased business will be done as capacity is increased. This week it will have seven furnaces in commission and the output will be larger. The efficiency of the mill is constantly growing, and the quality of the Steel turned out continues to be satisfactory in every way. The manager of the plow works at Ensley, with 23 years' practical experience in the use of Steel in manufacturing product, pronounces it as the best and easiest Steel to work he has ever encountered, and the most satisfactory in results. That is the verdict of all who have used it. The foundations of the Steel Rail mill are completed and they are now at work on the iron part of the mill. Over at the Alabama Steel & Wire Company business is booming. Their orders by mail are greater than they can promptly execute and they have called in their traveling representative. They are running day and night shifts and in one product (Wire Nails) they are turning out 3000 kegs per day. Lately they have purchased the cooperage plant adjoining their plant and will be their own coopers. The Steel plow works have been in operation but a few months, yet find their business developing an increase at such a rate that they are already cramped for room. In a short time they will expand by the erection of shop and shed additions and also of a wood working plant. So, when they are straightened out, everything about a plow—from Alpha to Omega—will be turned out under their own roof. At Wylam, which is almost within a stone's throw of Ensley, the Southern Car Works are located, and the foundations of the various buildings are well under way. They are located near shop No. 4 of the Pratt Mines. The electric car line will be extended to Wylam from Ensley, and another route from Birmingham to Ensley via Owentown will be opened. This line is alive to the importance of keeping railway facilities abreast with the demand for them. And this reminds me that the municipality has granted authority to the Metropolitan Rapid Transit Railway Company to build a line which will cover seventy or more city blocks. The line when completed will be in the shape of an ellipse and will cover a territory at present unoccupied. A guarantee deposit has been made, and in consideration of the building of a viaduct of steel to accommodate cars, vehicles and pedestrians, at Twenty-third street, thus connecting the North and South sides, the concession price of $100 per block is remitted. The company are to commence work within six months and complete the line within two years. Tangent spurs from the line will reach suburban points and we will then have as thorough a net of railway facilities as any city in the Union.

Another industry that has come to us is the Birmingham Steam Heating Company. From a central station they propose to conduct steam heat through pipes to stores, factories and dwellings and wherever it may be needed. It is very positively announced in some quarters that a locomotive plant will be located here in the near future and that a ten-story office building will soon mature. There is talk concerning each, but it is a little premature to announce anything definite concerning either. Considerable correspondence is being conducted to the end of inducing removals to this locality and the prospects for success are good.

Official returns show that total shipments in 1900 of Pig Iron, from Tennessee and Alabama, were 1,327,741 tons, and 817,972 tons of it went from this district. The amount exported was 238,615 tons, which is about 25 per cent. of the entire production of Alabama. The Bureau of Commence and Statistics of the United States puts total exports at 251,000 tons. The Birmingham district furnished it all save 50,000 tons. The total shipments of Cast Iron pipe from Alabama and Tennessee were 88,950 tons, Birmingham furnishing 29,114 tons; 9700 tons were exported.

Our trade is reaching out. Your correspondent saw Corliss engines being built for Roanoke, Va.; Jersey City, N. J.; Rome, Ga.; Talladega, Ala.; Texas and other points. One firm are making an engine to go to Johannesburg, South Africa. Another firm have been sending a great deal of Structural Iron and Steel Shapes to Cuba and Porto Rico, while of late inquiries for Steel Rails and Soil and Cast Iron Pipe are frequent from Mexico and Cuba.

New York.

Office of *The Iron Age*, 232-238 William street,
New York, January 23, 1901.

Pig Iron.—Current business in this district is rather light and prices are being shaded by both Northern and Southern furnace interests, some of this being due to a slight lowering in freight rates to some sections. Thus the rate from the Lehigh Valley to New England points has been reduced from $2.25 to $2.10 per ton. There is no inquiry for export. We quote: Lehigh, Schuylkill and Virginia Irons, No. 1, $17 to $18; No. 2 X, $15.50 to $16; No. 2 Plain, $14.25 to $15; Gray Forge, $14.25 to $15; Tennessee and Alabama brands, No. 1 Foundry, $15.25 to $15.50; No. 2 Foundry, $14.25 to $14.50; No. 1 Soft, $15.25 to $15.75; No. 2 Soft, $14.25 to $14.50; No. 3 Foundry, $13.50 to $14; No. 4 Foundry, $13.25 to $13.50; Gray Forge, $13 to $13.50.

Cast Iron Pipe.—The open winter this year has made it possible to lay Pipe all along, and the shops are shipping steadily and are making less stock sizes than usual. Competition in this district continues keen and low prices are being made on such jobs as come up. The largest inquiry in the market now is that from Troy for 2000 tons, to be closed on February 8. We quote $24.50 per gross ton for 8-inch Pipe at tidewater.

Steel Rails.—At the meeting of the Rail manufacturers last week it was decided not to advance prices. A considerable number of orders have been booked, conspicuous among them that of the Baltimore & Ohio Railroad for about 45,000 tons, in addition to the 12,000 tons placed with an Eastern mill some time since. The order was divided among a number of mills. We quote $26 for Standard Sections, and $32 to $32.50 for Girder Rails. We quote Spikes, 1.50c. to 1.60c.; Splice Bars, 1.35c. to 1.40c.; Square Track Bolts, 2.10c. to 2.15c., and Hexagon Bolts, 2.25c. to 2.30c.

Finished Iron and Steel.—No large contracts are reported in this district this week. We quote as follows at tidewater: Beams, Channels and Zees, 1.65c. to 1.70c.; Angles, 1.30c. to 1.40c.; Tees, 1.65c. to 1.75c.; Bulb Angles and Deck Beams, 1.90c. to 2c.; Universal Plate Mills, 1.58c. to 1.60c.; Sheared Steel Plates are 1.58c. to 1.60c. for Tank, 1.68c. to 1.70c. for Flange, 1.78c. to 1.90c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange and 3.25c. for Fire Box. Refined Bars are 1.40c. to 1.45c.; Common Bars, 1.30c. to 1.35c.; Soft Steel Bars, 1.35c. to 1.40c., and Hoops, 1.90c. to 2c., base, on dock.

Metal Market.

Office of *The Iron Age*, 232-238 William street,
New York, January 23, 1901.

Pig Tin.—On the strength of an advancing market in London prices here were raised ½c. Business here was extremely quiet, however, every one complaining of the lack of orders from the interior. That point has been reached where consumers are receiving shipments of metal purchased last November, and consequently do not need to buy now. The advance in London is due to the manipulation which is being directed from this side. It is said that there are two factions with diverging interests, and that the market has but seen the start of a struggle which may assume large proportions before one or the other of the parties have secured control. In absence of London quotations to-day the market was absolutely dead. Spot and January were quoted nominally 27c. There are sellers of February at 26.85c. Yesterday the London quotation was £123 7s. 6d. for spot, and £120 17s. 6d. for futures. It will be noted that the discount on futures has widened considerably, and now amounts to £2 10s.

Copper.—Owing to the fact that consumers are still well supplied with metal purchased toward the end of last year the market is still quiet and, in fact, dull. While the large producing interests continue to quote the nominal price of 17c. for Lake and 16⅝c. for Electrolytic, it is conceded in all other quarters of the trade that these prices can be shaded considerably. The prices named in this connection range between 16¾c. and 16⅞c. for Lake, and Electrolytic is quoted from 16⅝c. to 16½c. London has gone off a shade, and was quoted yesterday £71 2s. 6d. for spot and £71 15s. for three months' futures.

Pig Lead.—Prices are unchanged and business is very dull. It is reported that scarcely any one is buying, and in support of this fact it is said that January is always a dull month with the consumers in Lead. An official of the American Smelting & Refining Company stated that as January has always been so dull a month, prior to the consolidation of the lead producers prices were generally soft during this month. Shrewd purchasers took advantage of this situation and bought speculatively, owing to cheapness of the metal. Since the formation of the American Smelting & Refining Company prices have been more steady, and consequently the usual January speculation has been eliminated. He stated that he saw no reason why the prices of the company should be changed during the next six months. The prices quoted are 4.37½c. for lots of 50 tons and more, f.o.b. New York, and 4.32½c., St. Louis. Yesterday's London price was 5 shillings lower than the figure quoted a week ago to-day, the price being £16.

Spelter—Is still weak, with scarcely any demand. The price quoted to-day is 4.05c. to 4.10c. for ordinary brands. A strong attempt is being made by the large producers to overthrow the speculative interests which are depressing the market. The miners are also anxious to see a better state of affairs in this metal, and they are talking of exporting one-third of the output at a sacrifice in order to prevent continued flooding of this market. The St. Louis market is quoted 3.87½c. Yesterday's London cable shows a further decline of 5 shillings, the price quoted being £18 10s.

Antimony.—There is no change. Hallett's is quoted at 9¼c. and Cookson's at 10½c.

Nickel.—Is unchanged, prices being nominally 55c. to 60c. for small lots.

Quicksilver.—Has not been changed, prices quoted here remaining at $51 a flask of 76½ pounds in lots of 50 flasks or more. The London market is unchanged, at £9 2s. 6d.

Tin Plate.—A good, steady demand is reported from all branches of the consuming trades. Prices are unchanged, and the American Tin Plate Company have made the announcement that the present prices will hold until June 1 of this year. They quote on a basis of $4.19 per box of standard 100-pound Cokes, f.o.b. New York, and $4, f.o.b. mill.

A New Rod Mill.—The Henry Wire Company of Cuyahoga Falls, Ohio, will form a new company with a capital stock of $150,000 to erect a rod mill at Cuyahoga Falls to supply the Henry and Summit wire companies with rods. Both concerns are now large buyers of rods in the open market.

The Andover Furnace Record.—In referring to the record recently made by the Andover Furnace we omitted to state that the fire brick lining was made by the M. D. Valentine & Bro. Company of Woodbridge, N. J., whose works were started about 35 years ago and have never closed down since for want of orders, hard times or panics.

The United Coke & Gas Company of Broadway Chambers, New York, have taken some interesting contracts lately for the erection of Otto-Hoffman by-product coke ovens. They are building a plant of 100 ovens at Camden, N. J., and will build nearly 900 ovens for the Lackawanna Iron & Steel Company, about two-thirds of the number at Buffalo and the balance at Lebanon, Pa.

The Smelters' Consolidation.

Formal notice has been sent to the stockholders of the American Smelting & Refining Company notifying them of a meeting of the stockholders which is to be held on February 16, to take action upon a proposed increase of the capital stock of the company to $100,000,000, one-half of which is to be preferred and one-half common stock.

Following is the text of the notice:

"Such increase is deemed advisable by the Board of Directors, in order to enable this company to acquire the smelting and refining plants, appurtenant property and business of M. Guggenheim's Sons, and add to their working capital to the extent stated below.

"In consideration of, 1, the transfer to this company of said plants, property and business; 2, the payment in cash or in working capital of a sum equal to two-thirds of this company's working capital on January 1, 1901, and, 3, the payment in cash of the further sum of $6,066,666.66, there is to be issued and delivered by this company $45,200,000 in aggregate par value of their capital stock, one-half thereof to be preferred and one-half common.

"The present authorized capital stock of the company is $65,000,000, one-half preferred and one-half common, of which $10,200,000, one-half preferred and one-half common, is unissued. This unissued stock, together with the proposed increase of $35,000,000, one-half of which is preferred and one-half common, will provide the $45,200,000 of stock required as above.

"The properties to be acquired include plants and the property appurtenant thereto as follows: At Perth Amboy, N. J., smelting and refining and electrolytic copper plants; at Pueblo, Col., smelting and refining and copper reduction plants; at Aguas Calientes, Mexico, smelting and refining and copper reduction plants; at Monterey, Mexico, a smelting plant; in South America, mining and smelting interests; also valuable leases and contracts running a term of years, in the United States, Mexico and South America.

"After a careful investigation into the conditions of these properties, and also into the business and profits thereof, their acquisition upon the terms hereinbefore stated seems, to your officers and board, extremely desirable in the interests of the stockholders."

The proposed increase of the stock must be authorized by vote of two-thirds of each class of stockholders.

It is stated on good authority that the total cash, or working capital, payment to be made by the Guggenheims is nearly $15,000,000, making the cash resources of the American Smelting & Refining Company after consolidation about $25,000,000. This will probably obviate the necessity of borrowing money to handle the company's large business.

Allowing 100 for the preferred stock of the American Smelting & Refining Company and 60 for the common, the $22,600,000 preferred and $22,600,000 common which the Guggenheims are to receive would be worth in round figures $35,000,000. Against this the Guggenheims are to pay $6,066,666.66 in cash and, roughly, about $9,000,000 more in cash or working capital. This would allow about $20,000,000 for the Guggenheim plants, good will, &c.

The Valley Furnace Wages.—PITTSBURGH, PA., January 23.—The Conference Committee of the furnace employees of the Mahoning and Shenango Valleys has decided to notify the furnace owners that they are ready to discuss the wage question, with a view to settling the differences. If the furnace operators decline to meet them, the employees assert they will stop work on the morning of February 1, when the reduction of wages is to take effect.

A considerable rush is reported to be taking place to the new natural gas and petroleum fields of Eastern Washington and Idaho. It is said that there are indications that a large section of that district is underlaid with a plentiful supply of gas and oil.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING JANUARY 23, 1901.

Cap'l Issued.		Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Sales.
$29,000,000	Am. Car & Foundry, Common	19⅞-20¼	19¼-19½	19¾-20	19 -20¼	19¾-20½	20 -20¾	6,760
29,000,000	Am. Car & F'ndry, Pref. (7 % Non-Cu.)	68 -69	67 -68	-67	67 -67¾	-67¾	67 -67¾	3,700
19,000,000	Am. Steel Hoop, Common	25½-26¾	23 -26¾	24½-25⅛	23¼-24½	24 -25	25 -27¾	18,600
14,000,000	Am. Steel Hoop, Pref. (7 % Cu.)	71½-72¼	69 -72½	.....	.....	-70⅞	71¼-73	2,500
50,000,000	Am. S. & W., Common	38 -39⅞	38⅛-40⅛	40 -42½	38 -40	38 -39¾	39⅝-42⅛	98,400
40,000,000	Am. S. & W., Pref. (7 % Cu.)	83¾-84¼	84 -86¼	85⅛-87	83¾-86	.....	84⅞-85½	11,500
28,000,000	Am. Tin Plate, Common, N. Y.	57 -61⅝	59 -60½	59 -60½	57½-59	58 -59⅞	59 -61⅝	44,000
18,325,000	Am. Tin Plate, Pref., N. Y. (7 % Cu.)	-90	-87	-87	.....	.....	88½-88¾	1,100
7,500,000	Bethlehem Iron†	.....	.....	-59	59 -59¼	.....	.....	900
15,000,000	Bethlehem Steel, par $50, $1 paid in	-17½	17 -17½	-17½	.....	.....	-17	542
7,974,550	Cambria Iron, Philadelphia*	-45½	.....	.....	45½-45¾	.....	.....	561
16,000,000	Cambria Steel**	16⅝-17¼	16⅞-17¼	17¼-17½	16⅞-17	17⅛-17¼	17⅝-17½	17,416
11,000,000	Colorado Fuel & Iron	45½-47¼	43½-45¾	44½-45¾	41¾-44	43½-44½	44½-46⅛	21,900
46,484,300	Federal Steel, Common	45½-48⅞	46⅛-48⅛	46½-49	44¾-46½	44 -46⅝	46¼-49⅞	254,200
53,253,500	Federal Steel, Pref. (6 % Non-Cu.)	68½-70½	68⅝-69½	69¾-70⅝	68 -69	68½-69	69⅜-70½	25,200
32,000,000	National Steel, Common, N. Y.	39¾-41	38¼-39¾	38 -39¼	37 -38	37¼-38	37¾-40½	19,400
27,000,000	National Steel, Pref., N. Y. (7 % Cu.)	91½-91⅝	-91	-91½	90 -90¼	90⅛-91	91¼-91¾	2,000
40,000,000	National Tube, Common, N. Y.	56 -56½	55 -56¾	56⅛-57⅛	54 -56	54½-55	55 -57¾	11,000
40,000,000	National Tube, Pref., N. Y. (7 % Cu.)	98¼-98½	-98	-98	96½-97	95½-96¼	96 -96¾	3,714
5,000,000	Penna., Common, Philadelphia	.....	-67½	.....	.....	.....	.....	100
1,500,000	Penna., Pref., Philadelphia	.....	.....	.....	.....	.....	.....	....
12,500,000	Pressed Steel, Common	40½-42	40½-41½	40½-41½	36¼-40	35 -36⅛	37 -42	18,300
12,500,000	Pressed Steel, Pref. (7 % Non-Cu.)	78½-79	78¼-79	78½-79	.....	.....	79 -81⅞	1,500
27,191,000	Republic Iron & Steel, Common	13½-14	13¼-14	13⅞-14	13 -13½	12⅞-13½	13½-14	7,200
20,306,900	Repub. Iron & Steel, Pref. (7 % Cu.)	56 -58	55½-56¼	59 -60	55¼-56½	56¼-56¾	56⅞-58	5,900
7,500,000	Sloss-Sheffield S. & I., Common	.....	.....	.....	.....	.....	21 -21½	200
6,700,000	Sloss-Sheffield S. & I., Pref. (7 % Non-Cu.)	-67½	.....	.....	66½-67	65½-66½	-66½	800
20,000,000	Tennessee Coal & Iron	54 -55½	53¼-55	55 -56¼	53¾-55¾	54½-56	55¾-58	25,000
1,500,000	Warwick Iron & Steel (par $10)	.....	7½- 7¾	- 7⅞	.....	6¾- 7	- 7	3,565
15,000,000	International Pump, Common	26 -26½	.....	.....	-25	-24⅛	-26	500
12,500,000	International Pump, Preferred	.....	76½-77	76½-77	74½-75	.....	.....	1,500
11,000,000	International Silver	- 8⅛	7¾- 8	- 8⅛	- 7⅛	.....	.....	700

* Par $50. ** $10.50 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

Bonded indebtedness: Am. S. & W., $130,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., $2,000,000 6 % debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., $9,822,000 Illinois 5 %, $7,417,000 E. J. E. R. R. 5 %, $1,600,000 Johnson 6 %, $6,732,000 D. & I R. R. R. 5 %, $1,000,000 2d D. & I. R. R. R. 6 %, $10,000 land grant D. & I. R. R. R. 5 %; National Steel, $2,561,000 6 %; National Tube, none; Tennessee C., I. & R. R. Co., $8,367,000 6 %, $1,114,000 7 %, $1,000,000 7 % cu. pref.; Pennsylvania Steel, $1,000,000 5 %, Steelton, 1st, 1917. $2,000,000 5 %; Sparrow's Point, 1st, 1922, $4,000,000, consolidated, both plants; Bethlehem Iron, $1,351,000 5 % maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6 % $880,000, Col. Coal & Iron Con. Mort. 6 % $2,810,000, Col. Fuel & Iron Gen. Mort. 5 % $2,308,000. Also outstanding $2,000,000 preferred stock on which dividends have been paid to June 30, 1900. Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6 %, $2,000,000, Sloss I. & S. general mortgage 4½ % $1,835,000.

Iron and Industrial Stocks.

During the whole week the market in steel stocks has been under the influence of the mass of rumors which have been circulated, and values have receded until to-day, when there was a sharp recovery, notably in Pressed Steel Car, as the reports of the year's financial results; the American Steel Hoop, concerning which some dividend talk is heard; the Federal Steel, National Steel and Tennessee. The meeting of the American Steel & Wire Company comes off next Monday. Rumor has it that a very large sum will be written off.

	Bid.	Asked.
American Bicycle Company, common	5½	6½
American Bicycle Company, preferred	25	26½
American Bicycle Company, bonds	70	72
American Bridge Company, common	42⅛	42½
American Bridge Company, preferred	91	91¼
American Sheet Steel, common	..	21
American Sheet Steel, preferred	72½	74½
E. W. Bliss, common	..	137½
E. W. Bliss, preferred	125	..
Cramp's Shipyard stock	81	83
Crucible Steel Company, common	22	22½
Crucible Steel Company, preferred	77	80
Diamond State Steel	3⅛	3¼
Empire Iron & Steel, common	6	10
Empire Iron & Steel, preerred	39	45
National Enam. & St., common	19	22
National Enam. & St., preferred	80	83
New Haven	5	5¼
Otis Elevator, common	28¼	29
Otis Elevator, preferred	91	92
Pratt & Whitney, common	3½	5
Pratt & Whitney, preferred	45	55
Tidewater Steel	6⅞	7⅛
U. S. Cast Iron Pipe Company, common	4½	5
U. S. Cast Iron Pipe Company, preferred	32	35
U. S. Projectile	110	..
Va. C. I. & C., stock	3½	4½
Va. C. I. & C. bonds	33	35
H. R. Worthington, preferred	108	112

The report of the Philadelphia Company of Pittsburgh and affiliated corporations, shows gross earnings for December of $276,301 against $220,024 the same month in 1899. Net earnings for the same month are about $10,000 over the corresponding month last year. After paying all expenses there is left a surplus of $63,429 for the month. The earnings for the year 1900 are $2,482,880, against $1,867,590 in 1899, and the net gain, $332,080. The surplus of 1900 over that of 1899 is $352,942. The total net income of the affiliated companies for December is $103,998, against $98,573 for the same month last year. The balance at the end of the 12 months is $666,941, against $407,735 for the year 1899, an increase of $259,206.

The net earnings of the Tennessee Coal, Iron & Railroad Company for November, 1900, were $130,738, making the total for the year to December 1, $2,353,314, as compared with $285,610 and $1,561,004, respectively, in 1899.

Dividends.—The Colorado Fuel & Iron Company have declared a semiannual dividend of 4 per cent. on the preferred stock, payable February 15.

The International Steam Pump Company have declared a dividend of 1½ per cent. on the preferred stock, payable February 1.

The Kelly Nail & Iron Company of Ironton, Ohio, have declared a 50 per cent. semiannual dividend. This makes 220 per cent. in 18 months. The Belfont Iron Works Company have declared a 6 per cent. dividend.

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street,
New York, January 23, 1901.

While the last week failed to bring out any orders of especial significance and, in fact, business may not have been as good as was expected, still the cheerful tone has not changed. The numerous good things that are under way are still food for optimism, and the buoyancy of feeling is unshaken by tales of poor business in certain quarters. Most conspicuous among these lamentations is a report that is going the rounds to the effect that the Cincinnati shops are running on short time. Some are said to be in operation but three days of the week. At the same time merchants here who have no shop costs to worry about have before them propositions which look like some business and specifications which it is known are soon to be closed.

The most important work on the *tapis* is, of course, the British Westinghouse deal. Interest in this work is constantly growing and every day competition for the various plums grows much keener. That English machine tool builders will come in for a share, or are at least let in to a good extent in the bidding is well known by those who are familiar with the work. It is now stated that the matter is awaiting the arrival of bids from Germany. Henry S. Loud is the British Westinghouse rep-

resentative, who is receiving the bids at Pittsburgh. Mr. Loud, it will be recalled, was in charge of the erection and starting of the large steel plant of the Nicopol Mariopal Mining & Metallurgical Company at Mariopol, Russia, a short time ago. At that time he made several trips to this country and placed a number of large orders with American machinery firms. It is said that General Superintendent Lenge of the Pittsburgh Works will also be in charge of the new English plant.

Of the other large deals which are under way there have been no new developments of importance during the week under review. We are unofficially informed, however, that the Central Railroad of New Jersey machine shop job is to be hung up again. Three or four months is named as this period of suspense.

We are informed that the New York Central Railroad have prepared plans and are about to receive bids on buildings, which will include a machine shop and boiler house. They will be located at Albany, N. Y. A Philadelphia concern by the name of Ryan & Kelley are the contractors.

A fair sized lot of machine tools and a locomotive crane are wanted for the Boston Navy Yard by the Navy Department. The bids will be opened on January 29. The specifications and proposal blanks are issued by the Bureau of Supplies and Accounts. Following is a list of the tools required:

One 26-inch by 24-foot back-geared engine lathe.
One 24-inch back-geared engine lathe.
One 20-inch by 12-foot gap lathe.
Three 16-inch back-geared engine lathes.
Three 16-inch back-geared engine lathes.
One 2-inch by 24-inch screw threading turret lathe.
One duplex milling machine.
One 20-inch by 18-inch universal milling machine.
One 23-inch by 17½-inch universal milling machine.
One 33-inch by 19-inch universal milling machine.
One 48-inch by 19-inch plain miling machine.
One 24-inch pillar shaper.
One 20-inch pillar shaper.
One 15-inch pillar shaper.
One 18-inch surface grinding machine.
One 20-inch by 8-foot universal grinding machine.
One vertical 6-spindle turret drill.
One 65-inch universal radial drill.
Two 12-inch sensitive drills, electrically driven.
One 51-inch boring and turning mill.
One 60-inch automatic gear-cutting machine.
One 48-inch by 16-foot planer.
One 2½-inch by 19-inch keyseating machine.
Two speed controllers.
One magnetic metal separator.
One scroll sawing machine.
One hand shear.
One double-angle shears.
One 2½-inch heating, upsetting and forging machine.
One cold-saw cutting off machine.
One 4000-pound single stand steam hammer.
One locomotive crane of 10 tons capacity.

On February 12 bids will be opened at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., for a number of machine tools which are to be furnished to the Mare Island Navy Yard. Blank proposals will be furnished upon application to the bureau or the Navy Pay Office, San Francisco, Cal.

Parties in the trade have heard from S. Kumazaki, civil engineer of the Imperial Japanese Navy, who is now in Pittsburgh buying machinery and machine tools for equipping six arsenal buildings which are to be built at Maizurm and Kure, Japan. The contract for the steel buildings, it will be remembered, was awarded to the American Bridge Company a short time ago. The Japanese engineer speaks very highly of American machine tools.

We are informed that a large number of tools have been removed from the Hartford plant of the Electric Vehicle Company to Elizabethport. They are to supplant those destroyed in the recent fire at the Riker works.

Among the smaller purchasers who were in the market during the week were the Peacock's Iron Works of Selma, Ala., and the Dauson Mfg. Company of Basic City, Va. The former concern were looking up pneumatic tools and machine tools, and the latter company are looking for lathes, milling machines and various automobile supplies.

The Hamilton County Mining & Phosphate Company of Atlanta, Ga., are looking about for mining machinery.

It is stated that Thomas McFarley, proprietor of the Brooklyn Bedstead & Bedding Company, Brooklyn, N. Y., is arranging for a $100,000 addition to the present plant. A 500 horse-power electric power plant will be installed.

Four bids were received by the Bureau of Water Supply, New York City, on the 17th inst. for the two 15,000,000-gallon pumping engines and accessories which are to be installed at the new aquduct, Tenth avenue, near the Harlem River. Three of the bids were for each plant and one was a lump bid for both. They are:

Henry R. Worthington	$52,500
The George F. Blake Mfg. Company	96,460
Williams & Gerstle	98,813
Camden Iron Works (for both)	137,900

No award has been made as yet.

Francis E. Rainey, chief engineer for Frederick Nell & Co. of 97 Queen Victoria street, London, is now in this country purchasing pumping and other machinery and arranging for the representation of American machinery builders. He is endeavoring particularly to arrange for the English agency for American builders of water tube boilers, centrifugal pumping machinery and manufacturers of malleable pipe fittings. He expects to stay here about two weeks and is making his headquarters at the St. Denis.

The Manhattan Railway Company received bids yesterday for the piping and valves which are to be used in connection with their new electric power station.

We are informed that the New York Light, Heat & Power Company will also be in the market shortly for similar apparatus to be installed in their new Waterside electric station. This concern are said to be now closing on the minor mechanical accessories to be employed in the great plant.

The General Engineering & Construction Company were incorporated under the laws of the State of New York on January 18, with a capitalization of $55,000. The company have opened offices at 136 Liberty street. F. H. Gottlieb, who has for a number of years been prominent in engineering circles in this city and notably as consulting engineer for the Geo. V. Cresson Company, is president of the concern. H. W. Ludlum is the vice-president, and H. K. Boch secretary and treasurer.

We have been advised that the copartnership heretofore existing between David W. Mesick and Geo. W. Van Eps, and doing business under the title of Mesick & Van Eps, has been dissolved by mutual consent. The business will be continued by David W. Mesick under the title of the Fulton Foundry & Machine Company.

A. L. Bagnall, senior partner of Bagnall & Hilles, importers of American machinery and manufactured goods, at Yokohama, Singapore and Manila, is in this city. He is making his headquarters at the offices of the New York Insulated Wire Company, 15 Cortlandt street. He is placing heavy contracts for machinery and electrical appliances which are to be shipped to the Far East. The most important work which Mr. Bagnall has under way now is a large electric lighting plant for the Pulu Branie Smelting Company of Pulu Branie, an island within 2 miles of Singapore. The company operate large tin smelting plants, and propose to light up the island with electricity. Mr. Bagnall is now purchasing the machinery necessary for this work. Among the orders which he has placed is one for a 1000 horse-power addition to the plant of La Electricista. Among this equipment are Buckeye engines, Aultman-Taylor boilers, Wheeler condensers, Crane & Co.'s pipes and valves, General Electric dynamos and switchboard and wire from the New York Insulated Wire Company. Mr. Bagnall also purchased the materials for converting about 35 miles of suburban traction roads into an electric system for the Tokio Electric Railroad Company. This plant will also be of about 1000 horse-power, and the machinery has also been purchased in this country. It will consist principally of similar apparatus to that named above.

Machinery Wanted.—The McBryde Sugar Company, Ltd., Wahiawa, Kauai, Hawaii, are fitting up a new machine and blacksmith shop, and desire catalogues and price-lists of tools and appliances suitable for such plant.

E. L. Wilson Hardware Company of Beaumont, Texas, desire to obtain price and terms on oil well boring and drilling outfits for sinking wells from 600 to 2000 feet deep.

The Philadelphia Machinery Market.

Office of *The Iron Age*, Forrest Building, PHILADELPHIA, PA., January 21, 1901.

The first month of the year has opened up with a fair amount of new business. Inquiries were light during the early days of the month, but increased as the month advanced, and are now in good volume. Most of the business has been for domestic requirements, the home demand having improved very much since the first of the year. The export demand on the whole still drags, except in some special lines where it has developed considerable activity, but a general resumption of foreign business has not yet manifested itself.

More activity has developed among the manufacturers of machine tools, compression machinery, &c., and particularly among those making the heavier types of these machines, than in almost any other branch of the machinery trade. Numerous inquiries are on the market and many of the makers of this class of tools have orders in hand for from five to ten months' work. Some manufacturers are refusing new contracts except on long time deliveries.

The locomotive trade is quite active, numerous orders have been placed by the various railroad companies and the local locomotive company have orders in hand sufficient to carry them well into the latter part of the year.

Shipbuilding is very active, all the yards are full of work and employing their full number of men. New business still comes in, although the capacity of the various shipyards for the present year is more than fully covered.

The manufacturers of the smaller machine tools, engines, boilers, &c., have had a very good month; inquiries and sales in their lines are reported to have been of good volume.

Prices remain firm, and slight advances have been asked on heavy machinery, which is probably due to the expedition demanded for delivery. On the smaller tools some little cutting is heard, but generally prices can be said to be steady.

The Hess Machine Company, manufacturers of file making machinery, special tools, &c., continue extremely busy on both foreign and domestic orders. Inquiries are in good volume, especially from the home trade, which has developed considerable activity. Orders sufficient for several months' work are in hand for New York, Pennsylvania and New Jersey delivery, as well as for export to England and Germany. The latter countries are taking regular consignments of the Hess Machine Company's machines.

The Pennsylvania Machinery Company report a good month's business. Inquiries have been good on all lines and a number of satisfactory orders have been taken. Among recent shipments may be mentioned ten engines of various types ranging from 15 to 100 horse-power, which have been sold for Philadelphia and nearby delivery; and one 50 horse-power engine was shipped to London, England. Considerable business was also done in pneumatic tools, and a number of riveters and hammers were shipped to Wilmington, Del.

The Lodge & Shipley Machine Tool Company (Philadelphia branch) have had an active month; inquiries, although rather dull at the beginning of January, have picked up materially, and the present outlook for business is considered quite favorable. Among recent deliveries were 12 tools; cutter, lathes, &c., for the Baldwin Locomotive Works, Philadelphia, Pa.

Trade with Thomas H. Dallett & Co., manufacturers of portable power tools, &c., has been fairly active. Inquiries have increased as the month advanced and the prospect for future demand is good. A number of satisfactory orders have been entered and delivery of several of their standard tools has been made to local parties.

I. H. Johnson, Jr., & Co., report their trade to be in a very satisfactory condition. Inquiries are numerous and some very desirable orders have been booked. A number of lathes are under construction, especially in the larger sizes. Among recent deliveries were two 36-inch, two 30-inch, and two 28-inch lathes, all long beds. These were shipped to the Brooklyn Navy Yard for the United States Government. One 63 inch by 24 foot lathe has also been shipped to Milwaukee, Wis., and a number of smaller lathes have been delivered to local parties.

The Philadelphia Roll & Machine Company continue quite busy in all departments. Inquiries have been of good volume and a number of satisfactory orders have been taken. Tin plate machinery has developed the most activity during the past month, and the equipment for several tin plate mills is now under construction. Among recent shipments may be noted a number of rolls for Wood & Brothers Company, Conshohocken, Pa., and a large number of machinery parts for the Southwark Foundry and Machine Company, Philadelphia, Pa.

The Philadelphia Machine Tool Company's business continues fairly active. Inquiries have increased materially and some very satisfactory business is in sight. A number of their standard presses and testing machines have recently been delivered to local and nearby points.

The American Pulley Company, manufacturers of all wrought steel split pulleys, report a considerable improvement in their trade. Inquiries have increased and a number of orders have been taken. Foreign demand has also improved. They will shortly be in a position to make pulleys up to 42 inches in diameter. The presses for these sizes have already been set up, but some delay has been incurred by the non arrival of supplementary machinery. Among recent shipments may be noted 100 pulleys for export to Stockholm, Sweden, and to Copenhagen, Denmark. A large shipment is also ready for export to Australia, and Western and local deliveries have likewise been heavy.

The George V. Cresson Company are busy in all departments. Inquiries are of good volume and the prospects of future business quite favorable. Foreign trade is fairly active and inquiries from this source improving. Recent shipments of rock crushers to a cement plant in New York State and rolls and crushing machinery to a copper mining plant in Maryland have been made. A large manufacturing plant in Providence, R. I., has also been installed with power transmission machinery, and a complete equipment of shafting, pulleys, &c., has recently been exported to Holland.

The Harrison Safety Boiler Works have experienced the usual first of the year falling off in trade, but have recovered the normal condition again. Inquiries are active and foreign trade is promising. Foreign shipments have been averaging about one per week, the most recent being a large heater to Liverpool, England.

The Link-Belt Engineering Company are fairly busy on general work. Inquiries have been heavy and the estimating department is extremely busy. Considerable large work is in the market and the prospects for trade in the near future are very good.

The Pedrick & Ayer Company, manufacturers of compression machinery, tools and special machinery, still continue exceptionally busy. Inquiries if anything are heavier than ever, and a number of new orders have been booked. Improvement is to be noted in foreign demand, a number of riveters have recently been exported, and a large compressor was lately shipped to France. Shipments of riveters and other tools have also been made to local and nearby points.

At the crane department of the Niles-Bement-Pond Company continued activity may be noted. The improvements to the plant have been practically completed, new machinery and tools installed and many of the old tools moved to more advantageous position. Inquiry continues good and a number of orders have recently been taken, among which are three electric traveling cranes; one 35-ton and two 15-ton capacity, for the Lewis Foundry & Machine Company, Pittsburgh, Pa., and one 10-ton crane for the Hansell-Ecock Company, Chicago, Ill. Over 50 cranes are now in the course of erection by this company, and the improvements now completed will enable them to make better deliveries than ever before. Several cranes have recently been delivered, among which was one of 60-ton capacity for the Midvale Steel Company, Philadelphia, Pa.

Dienelt & Eisenhardt continue running their plant on full time. Inquiries have improved and the prospect for increased trade is favorable. The foreign demand with them is very active and the plant is now running almost entirely on work for export. Oil cloth printing

machinery is being regularly shipped abroad and orders have been received for several steam hammers for foreign delivery. A new two story erecting shop, 40 x 37 feet, is being built, and will aid greatly, when completed, in enabling Dienelt & Eisenhart to make prompt deliveries.

Alfred Box & Co., crane builders, Philadelphia, Pa., report business in their line as being very brisk, there being a steady and increasing demand for cranes of the several types, leaning, however, more strongly to the electric traveling designs. Among contracts recently completed have been a 5-ton, 3-motor, electric traveling crane for Wickwire Bros, Cortland, N. Y.; 5-ton, 3-motor electric jib, and 3-motor electric traveling cranes for the core room of the Penn. Steel Casting & Machine Company, at Chester, Pa.; four 7-ton electric traveling cranes, and three 5-ton portable electric jib cranes have also been shipped to the General Electric Company, Schenectady, N. Y.; one 10-ton electric traveler for the latter company's machine shop has been shipped recently to the Schenectady works, in addition to two 12-ton hand power double trolley traveling cranes to their Lynn, Mass., plant. Hand traveling cranes, ranging up to 10-ton capacity, have also been supplied to Morse, Williams & Co., Incorporated; H. W. Butterworth & Sons Company, and the Neafie & Levy Ship Building Company's new brass foundry, in Philadelphia. The Manhattan Railway Company's Seventy-fourth street and Avenue A power station, New York City, has been equipped with two 10-ton hand power cranes; also the Metropolitan Street Railway Company's Twenty-fifth street station, New York City, with a 15-ton hand power traveler. Two additional hand power travelers of 25-ton capacity, each with auxiliary lift, have quite recently been put into service at the river station of the United Electric Company of New Jersey, Newark, N. J., and a 25-ton crane of the same type at the Union street station, Niagara Falls Power Company, Niagara Falls, N. Y. The new foundry extension at R. S. Newbold & Son Company plant, Norristown, Pa., has been equipped with a 30-ton, 4-motor electric traveling crane, and a third 10-ton electric traveler recently started up to serve the stock yards of the Passaic Rolling Mill Company, Paterson, N. J. Two 20-ton hand power cranes, each with 5-ton auxiliary hoist, are now being installed in the 129th street and Amsterdam substation of the Metropolitan Street Railway, New York City. Orders now on hand and under way are a 25-ton hand power crane for the power house of the United Electric Company of New Jersey, at Metuchen, N. J., and one of 35-ton capacity for the New York, New Haven and Hartford Railroad Company's Warren, R. I., station; a 10-ton hand power crane is being completed for Henry Morris, superintending engineer of the Mellor & Rittenhouse Company, in Camden, N. J.; four electric traveling cranes for the new plant of the Ventnor Stone and Brick Company, Chelsea, N. J., are nearing completion, as well as an electric traveling crane for the General Electric Company's Lynn, Mass., shops; R. S. Newbold & Son Company, at Norristown, Pa., have their order in for a 6-ton electric hoisting trolley to serve their boiler shop crane. A 10-ton electric traveler, with run-ways and supports, is to be installed at the Newton Machine Tool Works, this city. The last finishing touches are about being put on the crane equipment for the new plant of the Seaboard Steel Casting Company, at Chester, Pa., comprising a total of ten electric traveling cranes, ranging from 10 to 35 tons working capacity. Box & Co. have recently completed work on their new erecting shop, which will greatly add to their facilities, in handling the large electric traveling cranes. The new shops are located close to their present works, and, like the latter, have direct siding connections with both the Philadelphia & Reading and Pennsylvania Railroad systems. Contracts already booked will employ Box & Co.'s full force well into the new year, though with the additional facilities now possessed arrangements can readily be made to carry through very promptly any crane contracts where time delivery is an important factor.

The Energy Elevator Company continue busy. Inquiries since the first of the year have materially increased and a number of good orders have been taken. A heavy freight elevator was recently shipped to Saxonburg, Pa., and another to Halifax, N. S. An automobile lift, of 4000 pounds capacity, and a number of smaller elevators have been installed in Philadelphia and nearby places.

Morse, Williams & Co. report inquiries heavy and resultant business very good. A number of good orders have been booked for both freight and passenger elevators. They are now busily engaged on a large number of orders for local and general delivery.

With the Baldwin Locomotive Works trade has been very active. Inquiries have been heavy and a number of large contracts have been booked. The new flange shop is rapidly nearing completion and is expected to be ready for occupancy inside the next 30 days. Among recent orders were 48 locomotives of the heavy Mogul type for the Pennsylvania Railroad Company and 60 for the Philadelphia & Reading Railway Company. Fifty of these locomotives are to be of the consolidated freight type, and ten of the standard passenger type. Shipment by the steamship "Fortuna," loading at Port Richmond, Philadelphia, will be made of ten Atlantic type passenger locomotives for the Paris, Lyons & Mediterranean Railroad, and eight heavy consolidated freight engines for Bilbao, Spain. Shipment from New York by the steamship "Bethuana," will also be made of 22 locomotives for New Zealand delivery. Of these ten are of the 10-wheel passenger type, and 12 of the coupled tank engine front and back truck type. Deliveries are also being regularly made to the Baltimore & Ohio, Union Pacific and Pennsylvania railroads.

The Neafie & Levy Ship and Engine Building Company are extremely busy, inquiries are of good volume and several good contracts have been taken. The shipyard has never been busier, the three torpedo boat destroyers for the Government are about three-quarters completed and the United States cruiser "Denver" is three-eighths completed. All the stocks are occupied and contracts for six vessels are in hand on which the keels have not yet been laid. Among recent orders is one for a steel sea going tug boat, the "Carlisle," for the Philadelphia & Reading Railroad, the dimensions of which are 170 feet long, 29 feet beam and 18 feet deep. Hull and house will be of steel and she will be equipped with triple expansion engines, 18, 28 and 45-inch cylinders, and 30-inch stroke. Two 12 by 12 feet 6 inches marine boilers will supply the steam. An engine and boiler are also being built for Philip Weaver & Son, Baltimore, Md. The engine is of the compound type, 15 and 30-inch cylinders by 32-inch stroke, and the boiler will be 11 by 11 feet 4 inches. These are to be placed in a wooden hull tug boat.

W. W. Lindsay & Co., engineers and constructors, report numerous inquiries on all lines of work, with very good prospects for future orders. Some recent contracts taken include a chain shed and anchor rack for the Philadelphia Navy Yard, and also a stone building, 51 by 101 feet, with concrete foundations and floors, railway sidings and tracks.

The Youngstown shops of the American Bridge Company, at Youngstown, Ohio, owing to improvements recently made and now under way, have had their capacity increased about threefold, and are being put in the very best condition for doing heavy railroad work. A new reaming plant is to be added, ten new cranes are being installed, the compressor plant has been increased threefold and the riveting facilities have been brought up to the very latest standard of excellence. The American Bridge Company are employing at the Youngstown branch 250 men, and are running day and night, and expect to increase this force.

An examination of the sales sheets of the American Sheet Steel Company, made last Saturday in Pittsburgh by Theodore J. Shaffer, president of the Amalgamated Association of Iron, Steel and Tin Workers, and John Jarrett, agent of the American Sheet Steel Company, showed that the sales average during November and December was the same as that of the previous two months. Therefore, there will be no change in the wages of the Sheet mill men during the next two months.

HARDWARE.

The time of year is upon us when most of the Retail Hardware Associations hold their annual meetings, and our columns give evidence of the attention which is being given to these gatherings. There can be no doubt that it is desirable that this department of the trade should get together. For a long time the manufacturers have been accustomed to have their associations and on lines in which their interests are identical to take action for their common protection. The jobbers also have more than one exceedingly active and successful association for the promotion of jobbing interests. It is obviously reasonable that the retail merchants also should look after their own welfare, and see to it that they are given due recognition by the representatives of other departments of the trade. In many respects the position of the retailer is a peculiarly difficult one, but there is little doubt that some of the annoyances which he suffers could be diminished, if not removed, by concerted action. The desire of both manufacturers and jobbers to stand well with the retail merchants gives them ground for expecting that their reasonable requests will carry especial weight. Care, however, should always be taken that no unreasonable demand is made, and that there should be on the retailers' part a recognition of the rights of both the makers and the distributers of goods.

Centralization of Manufacturing Plants.

In all the multitudinous discussions regarding the nature and tendencies of the present industrial combinations of the day, one matter of seeming vital import has received but scant attention, and but little stress is placed upon the fact that these combinations fail signally so far to illustrate that concentration which is the principal reason for their being.

In the world of nature mere association of incoherent elements does not mean cohesion, and a chemical change has to take place before a homogeneous condition can result. The assembling of the various scattered factories under one ownership and one direction is in direct opposition to that general law which dictates that great things of permanence expand from within and not by accretions from without. The problems, therefore, before the aggregations of the industrial world are those of reorganization and assimilation. While it is true that concentration usually means strength, and diffusion means weakness, yet examples are not wanting in the past of manufacturing plants achieving great success when scattered over the country in advantageous localities, but under one general direction. It is always a very great advantage to be close to the sources of supply, and rapid freight transit has not materially disturbed the proportion of this state of affairs as regards the local mill.

Experience has clearly demonstrated that in most cases the ability to get goods quickly is of more benefit to jobber and retailer than somewhat lower prices and slow shipment. The advantages on the other hand of the centrally located manufacturer, with his mills all around him in easy touch, are so obvious that they are easily enumerated.

Among these is the greater promptness with which he can fill orders, dispatch business, and answer inquiries. In the matter of economies he must always handicap his scattered competitor. Few things have been so noteworthy as the failure of so many of the promised economies of the large combinations, yet it is natural enough, for a multiplication of factories means a multiplication of men, all doing the same thing—of more departments and subdivisions and the inevitable systems, which, even when effective, are usually expensive. There is, again, the uniformity of product and satisfactoriness of quality, which cannot be so well brought about by a dozen different superintendents operating under differing local conditions. When the present combinations were formed there were taken in mills whose products differed widely in quality, but it was the expressed intention of the new owners to establish a general grade of uniformity throughout all the plants. This expectation has been approximated rather than realized, for individual mills still continue to be noted for the excellence or for the inferiority of their product, as in the past.

The establishment of local warehouses is again a plan whereby the centrally located manufacturer can overcome the effect of his rivals' mill being close to the buyer of his goods. A warehouse is a very much simpler and less expensive proposition than a local plant and has nearly all of its advantages and few of its disadvantages.

Experience seems to show that the gain in freight matters on part of the local plant is largely theoretical and is greatly overborne by the loss in ability to produce cheaply. This fact is apparent enough to the directors of the large combinations, as is seen in the dismantling of plants not favorably situated, and in the gradual but steady concentration of manufacturing in more favored localities. As competition increases this crystallization will necessarily become more pronounced, as only the best situated mills will be available for the hard fight. Greatest of all the advantages that the central location offers, and yet the one which can least be expressed in definite figures, is that of the possibility of the general direction under a dominant personality, who is in close touch with all co-workers of importance, and whose finger is upon the pulse of all affairs.

No system, however perfect and elaborate, operating from a central office 500 miles away, can ever produce the results that can be accomplished by a strong man on the ground, supplementing system by personality.

It is always unwise to prophesy, and never more so than in the present case, where so many elements in the equation are entirely unknown; but it certainly will be among the most interesting events in commercial history to see how the large industrial corporations will adapt themselves to the new conditions which confront them, and by what evolution they will put themselves in shape to meet that new competition, now so imminent. All that can be said is that in any case it promises to still be a development along the lines of concentration, for the outlook is for a battle of the giants rather than a return to old conditions.

Condition of Trade.

Reports from the various interests in the trade indicate that business is assuming good volume, with general activity among manufacturers, jobbers and retailers. As a general rule the jobbing trade are buying in fair quantities but with a certain conservatism, deeming it safe to purchase in sufficient quantities to cover their near requirements, but not caring to indulge in speculative buying. Retail merchants are following a similar course, and in many instances are sounding the market carefully, so as to get the best prices obtainable. Manufacturers report many inquiries from the larger and more enterprising retail merchants, whose business they regard as very desirable. Traveling salesmen agree substantially in

their reference to the condition of things throughout the country as encouraging the hope of a large and successful business this spring. Prices are without important change, but most all the revisions are in the direction of lower quotations. In several lines of heavy goods there is reluctance on the part of the trade to buy otherwise than cautiously. The changes in freight rates which go into effect February 1 have the effect of diminishing purchases and shipments during the remainder of this month and tend to induce slight concessions in some heavy goods which will be immediately influenced thereby. Export business presents few new features, but is on the whole growing and full of promise. The attention which is being given to marketing American goods in England, and especially London, where the foreign trade of the world centers, is one of the features of the situation, and there is little doubt that systematic efforts will be made by our manufacturers to get in this way into still closer touch with the markets of the world. The way in which foreign prices have been yielding makes American competition more difficult, but in a great many lines there is as yet no serious obstacle.

Special Reports.

Chicago.

(By Telegraph.)

The demand for strictly Shelf Hardware is considerably in excess of that of last January. The volume of jobbers' business, however, is perhaps not quite so large as at that time, which is due to special causes. It will be remembered that last January a very large business was being done in Wire Nails and other staple goods in consequence of advanced prices. This year the demand for such goods is excellent for the season, but is not as great as a year ago, owing to the lack of such a stimulus. The demand for the general line, however, is very satisfactory, including a steady run of orders for new stocks and for the enlargement of the business of established merchants. Prosperous conditions throughout the country are causing merchants to extend their lines and are influencing others to engage in the trade. The improved conditions prevailing throughout the West are shown by reports from commercial travelers, who state that few vacant stores are now to be found. Some towns are reported to be absolutely without a vacant store for the first time in ten years. The demand for all kinds of Hardware entering into the construction of buildings is large, showing that considerable activity prevails in building operations. This activity is naturally expected to increase with the approach of spring. Prices are steady and more inclined to strength. The Heavy Hardware trade is more active than a year ago. Difficulty is experienced by jobbers in securing satisfactory deliveries of Iron and Steel, especially Steel. This is an unusual condition during the midwinter, which would appear to presage some scarcity toward spring when the demand grows heavier.

St. Louis.

The strong demand for goods noted during the first half of January is extending into the last half and with somewhat increased force. All jobbers say that orders are numerically ahead of last year. Exceedingly favorable reports on the outlook for future business are being sent in by salesmen and accompanied by liberal orders showing present wants of the trade. There seems to be a need for all lines of goods, jobbers' assembling floors showing that individual orders call for quite general assortments. Carpenters' Tools are beginning to move out in readiness for the spring demand. Builders' Hardware is in fair movement and inquiry is steadily improving. Rapid progress is being made on building improvements, locally, there being more than the usual number now under way. Binder Twine is in very good demand and, it is reported, at stiffened prices owing to changes in the hemp market. Sisal Rope is also active. The Heavy Hardware interests are handling an excellent line of business. Orders and inquiries are increasing and more confidence is being shown by the placing of larger orders. It is especially mentioned that Carriage and Machine Bolts, Nuts and Washers are in heavy demand.

Notes on Prices.

Wire Nails.—There is demand for a limited quantity of Wire Nails for immediate shipment, but contracts for February shipment are being made. Announcement has been made of a reduction in Pittsburgh freight rates to Eastern points, to go into effect on February 1. To all points taking New York rates the reduction will be 5 cents per 100 pounds, and it is understood that the differential will be maintained to other Eastern points. While there will be no change in mill price, the delivered cost of Nails will be lessened in proportion to the reduction in freight. This means a decrease in the value of Nails in stock February 1. To induce sales, it is reported, some jobbers are offering to divide the prospective loss with buyers by shading the present price. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots	$2.20
To jobbers in less than carload lots	2.25
To retailers in carload lots	2.30
To retailers in less than carload lots	2.40

New York.—Wire Nails continue in light demand in the local market and at slight concessions, as noted above. Prices are as follows:

To retailers, carloads on dock	$2.48
Small lots at store	2.55

Chicago, by Telegraph.—Manufacturers of Wire Nails are not yet finding any material falling off in their trade. Some sections are taking larger quantities than others, which is due to the more active prosecution of building operations in such districts. Factories are running on full time, and manufacturers believe that if such activity can prevail during the winter a very heavy increase in business is assured when spring opens. Jobbers continue to report a good demand from stock. Prices are held at $2.35 for carload lots and $2.40 to $2.45 for small lots from stock.

St. Louis.—The demand for Wire Nails on all hands is keeping up to a surprising extent. The mild weather continues and sales for the time being are expected to show no falling off. At no time in recent months has there been any dullness in the Wire Nail market. Price to retailers in carloads is $2.40, base; for smaller lots, $2.45, base.

Pittsburgh.—There is a moderate volume of business in Wire Nails, buyers placing orders mostly for immediate wants. A better demand is expected when spring trade opens. There has been no intimation as yet of any change in price of Nails. We quote, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots	$2.20
To jobbers in less than carload lots	2.25
To retailers in carload lots	2.30
To retailers in less than carload lots	2.40

Cut Nails.—The effect upon Cut Nails by the announced reduction in freight rates is the same as upon Wire Nails. Demand at present is not very active. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off in 10 days:

Carload lots	$1.95
To jobbers in less than carload lots	2.00
To retailers in less than carload lots	2.10

New York.—The local movement in Cut Nails is moderate. Prices are as follows, with slight concessions in some cases:

To jobbers in carload lots on dock	$2.13
To jobbers in less than carload lots on dock	2.18
To retailers in less than carload lots on dock	2.31
Small lots from store	2.25

Chicago, by Telegraph.—The demand for Cut Nails continues quite good, within the limits now obtaining on this class of Nails. Carload lots are held at $2.15 and small lots from stock at $2.25.

St. Louis.—The buying movement in Cut Nails this

week is in line with the demand for Wire Nails. Price ranges from $2.30 to $2.40, base.

Pittsburgh.—There is a fair demand for Cut Nails; larger than usual at this season of the year. Prices are firm, and we quote, f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days, as follows: Carload lots, $1.95; jobbers, less than carload lots, $2.

Barb Wire.—Quite a volume of business in Barb Wire is being booked for spring delivery. The announced reduction in Pittsburgh freight rates is having some effect on shipments of Wire. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted	$2.50
To jobbers in carload lots, Galvanized	2.80
To jobbers in less than carload lots, Painted	2.55
To jobbers in less than carload lots, Galvanized	2.85
To retailers in carload lots, Painted	2.60
To retailers in carload lots, Galvanized	2.90
To retailers in less than carload lots, Painted	2.70
To retailers in less than carload lots, Galvanized	3.00

Ellwood and Baker Wire is 5 cents and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

Chicago, by Telegraph.—Conditions as to Barb Wire are practically the same as in Wire Nails. The demand as a whole is very good, particularly in certain sections in which fencing can be put up through the winter. A large business continues to be reported in Woven Wire Fencing. Quotations are unchanged, at $2.65 for carload lots of Painted and $2.95 for Galvanized Barb Wire, with small lots from stock selling at $2.70 to $2.75 for Painted and $3 to $3.05 for Galvanized.

St. Louis.—An unusually large tonnage of Barb Wire is moving, manufacturers being constantly pressed for more prompt shipments. Jobbers are in receipt of splendid orders and are gratified at the continued strong call. Price for Painted in carloads to retailers is $2.70; smaller quantities, $2.75. Galvanized is 30 cents higher.

Pittsburgh.—Demand is dull, but will probably improve with the opening of spring trade. For domestic trade we quote: Galvanized Barb Wire, $2.80, in carload lots to jobbers, and Painted, $2.50. Terms 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

Plain Wire.—The demand for Plain Wire is satisfactory for the season, with a later increase expected. Eastern shipments will doubtless be stimulated by the announced reduction in Pittsburgh freight rates. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes. Plain.	Galv.
To jobbers in carload lots	$2.15	$2.55
To jobbers in less than carload lots	2.20	2.60
To retailers in carload lots	2.25	2.65
To retailers in less than carload lots	2.35	2.75

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the advances indicated in the following table:

Plain Fence Wire Advances (Catch Weights).

Nos.						Galvanized.
6 to 9	Base					$0.40 extra.
10	$0.05	advance	over	base		.40 "
11	.10	"	"	"		.40 "
12 and 12½	.15	"	"	"		.40 "
13	.25	"	"	"		.40 "
14	.35	"	"	"		.40 "
15	.45	"	"	"		.75 "
16	.55	"	"	"		.75 "
17	.70	"	"	"		1.00 "
18	.85	"	"	"		1.00 "

For even weight bundles, 50 pounds or over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—Trade in Plain Wire is reported exceptionally good for the season. Carload lots, Chicago delivery, are quoted at $2.30, base, and small lots from stock at $2.35 to $2.40.

Pittsburgh.—There is a satisfactory demand for Plain Wire, considering the season of the year. Larger business is expected when spring trade opens. For domestic trade we quote:

	Plain.
To jobbers in carload lots	$2.15
To jobbers in less than carload lots	2.20
To retailers in carload lots	2.25
To retailers in less than carload lots	2.35

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, $1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Sheet Zinc.—Under date January 16 the base price of Sheet Zinc was made 6 cents per pound, f.o.b. mill. Discounts are as follows:

	Cash With Order.	Quantity.	Total.
Carload lots	3 per cent.	5 per cent.	8 per cent.
9000-pound lots	3 per cent.	3 per cent.	6 per cent.
6000-pound lots	3 per cent.	2 per cent.	5 per cent.
3000-pound lots	3 per cent.	1 per cent.	4 per cent.
Less than 3000 pounds	3 per cent.	0 per cent.	3 per cent.

Horseshoes.—There has been no change in the general situation in the Horseshoe market since our last reference to it. The pooling arrangements referred to are in operation, and, so far as we can learn, the prices are being maintained. The fact that a prominent maker is outside of the association and selling goods at a lower price is regarded as an important feature in the market.

Bright Wire Goods.—The Bright Wire Goods market is said to be again characterized by regularity in prices, but many goods have been purchased at relatively low figures during the time when it was more or less demoralized. As the result of this condition of things a good many jobbing houses are selling at less than the manufacturers' prices.

Wire Cloth.—There have been further concessions in the Wire Cloth market and 90 cents is readily obtainable on good orders.

Tire and Stove Bolts.—A reduction has been made in the price of Tire and Stove Bolts, the base discount being put at 77½ per cent. The extra discounts are as before.

Cordage.—In the Rope market buying is confined to small lots with possibly a slight increase in demand over that of two weeks ago. With the stronger position of Sisal Hemp Sisal Rope is stronger, as indicated by a cessation of shading prices. Since the last of November, when 7 cents was the uniform base price of Sisal Rope and 10 cents that of Manila Rope, the market has had a sagging tendency. Present quotations, on a basis of 7-16 inch and larger, are as follows: Manila, 9½ to 9¾ cents per pound; Sisal, 6¾ to 7 cents per pound.

Binder Twine.—There is very little activity in the Eastern Twine market. A few orders have been taken, but buyers are reluctant about making purchases, as a rule, unless prices are guaranteed. It is reported that the large Binder manufacturers in the West have control of the Twine situation to a large extent; that they have been instrumental in keeping the price of Twine low and that of Hemp high, and that to a portion of the dealers who sell their machines they ship Twine and name the price. Eastern prices are somewhat firmer than at our last report owing to the stiffening of the Sisal Hemp market. General quotations are as follows for small lots of Twine, with a rebate of ¼ cent per pound for carload lots, f.o.b. Eastern factory:

White Sisal, 500 feet per pound	7¼ to 7½c.
Standard, 500 feet per pound	7¼ to 7½c.
Manila, 600 feet per pound	9 to 9¼c.
Pure Manila, 650 feet per pound	10½c.

Glass.—The National Window Glass Jobbers' Association have contracted to take 700,000 boxes of Window Glass of the combined product of the American Window Glass Company and the Independent Glass Company, the Glass to be delivered during the months of January and February. No discounts have been announced by either company, and the price paid by the jobbers is being kept secret. In a general way, however, it is stated that the average advance in price was 30 per cent.

The combination between the two companies is apparently good for at least two months. The manufacturers are credited with a statement to the effect that another advance in price will be made at the termination of this contract, which will restore prices to those existing previous to the first cutting. It is reported that the American and Independent factories will be closed down before May 1 to reduce production. The National Window Glass Jobbers' Association have fixed the price of Glass in less than carload lots at 85 and 5 per cent. discount from the jobbers' list of September 1, 1900. This price covers all sizes of both single and double strength, and applies to the entire country. They have not as yet announced discounts for carload lots.

Paints and Colors.—*Leads.*—The jobbing demand for White Lead in Oil is good for the season. Owing to favorable weather more Lead is going into consumption than is usual during the winter months. Prices continue as follows: In lots of 500 pounds and over, 6½ cents; in lots of less than 500 pounds, 7 cents per pound.

Oils.—*Linseed Oil.*—The Linseed Oil market is in a condition perplexing to the trade. One prominent company advanced prices on the 21st to 60 cents in lots of five barrels or more, and 61 cents in lots of less than five barrels, for City Raw. Another large concern continue to quote City Raw at 56 to 57 cents, according to quantity. It is rumored, however, that they are cutting down customers' orders, shipping but a part at these prices. The same concern are quoting State and Western Raw at 56 cents, while some independent crushers are refusing business at less than 60 cents. Demand under these conditions is not large.

Spirits Turpentine.—The Turpentine market has been somewhat stronger during the past week, resulting in an advance to 41 cents for Southern and 41½ cents per gallon for machine made barrels at this point. Demand is confined to present requirements to a large extent.

The Ohio Hardware Association.

ACTIVE preparations are being made for the coming meeting of the Ohio Hardware Association, which promises to be an especially important one and largely attended. The following call has been issued by George M. Gray, Coshocton, Ohio, the corresponding secretary:

The seventh annual session of the Ohio Hardware Association will be held in Cincinnati, February 26, 27 and 28. Begin now to arrange your business that you may be present.

This promises in some respects to be the greatest meeting of the association ever held, and no Hardwareman can afford to miss it.

Questions of importance will be presented and discussed, excellent papers will be read, the advisability of establishing an insurance company exclusively for Hardwaremen will be considered, the question of joining the Interstate Retail Hardware Dealers' Association will be determined, and, besides, Cincinnati is making preparations for a royal reception to our association.

We want your presence and active participation. Let us hear from you on any subject you desire brought up at the meeting. We would be pleased to receive any suggestions regarding the work of the association that you may offer. An excellent programme is now being prepared for this session and will be mailed you before long. Keep this before you and don't forget the date.

Another Shovel Plant.

ELSEWHERE in this issue, under "Help Wanted," appears an advertisement signed "Shovels," care *The Iron Age*, Hamilton Building, Pittsburgh, for a man to erect and operate a Shovel factory of large capacity. This is an exceptional opening for a man who thoroughly understands the Shovel business, as the concern are one of the largest in the West and are now large manufacturers of other lines of goods. Those interested in the advertisement will do well to write to the address given in the advertisement.

Fifteenth Annual Dinner of the Hardware Merchants' and Manufacturers' Association of Philadelphia.

THE fifteenth annual dinner of the Hardware Merchants' and Manufacturers' Association was held at the Manufacturers' Club on Thursday evening, January 17, at which there were present about 85 members and invited guests. The reputation of the Manufacturers' Club for the excellence of its *cuisine* was fully maintained, and received general commendation from those who were fortunate enough to be present.

The tables were handsomely decorated and souvenirs of small Hardware articles were furnished in liberal quantities by such firms as Henry Disston & Sons, Enterprise Mfg. Company, North Bros. Mfg. Company, McCaffrey File Company, G. & H. Barnett Company, Miller Lock Company, Russell & Erwin Mfg. Company and others.

The *menu* card was of a very distinctive and highly ornamental character. The front cover gave an exceedingly realistic representation of an old time kitchen fire place, with logs ablaze, and a large iron pot suspended a little to one side of the blaze as though the contents were simmering and waiting further developments.

The broad old fashioned shelf above the fire place was decorated as in ye olden time, with candle stick and plates, while immediately below in beautiful gilt letters was the inscription "Fifteenth Annual Dinner of the Hardware Merchants' and Manufacturers' Association of Philadelphia, Thursday evening, January 17, 1901."

At the right hand bottom corner the name of each guest in gilt letters was also inscribed.

The president of the association, Hugh McCaffrey, was absent, owing to the sudden and unexpected death of his brother, John McCaffrey. William C. Peters, the vice-president, was also absent on account of sickness, so that the duties of presiding officer fell upon T. James Fernley. The speaking was of an unusually high order, and met with the most cordial approval.

The first speaker on the list was the Hon. Samuel H. Ashbridge, Mayor of the city of Philadelphia. The topic was "The Twentieth Century Business Man and the Public Servant."

John Bindley, president of the National Hardware Association of the United States, was to reply to the second toast, "The Man." A letter from Mr. Bindley was received, however, stating that the condition of his health during the past few days made it imperative that he should not risk the journey at this inclement season of the year.

The next speaker on the list was the Rev. John R. Davies, D.D., the topic being "The Obligations of Two Millenniums." Dr. Davies, who is comparatively a new comer to Philadelphia, made a most excellent impression, his remarks being bright and witty, while at the same time they were an inspiration to greater diligence, to greater sympathy, and to a higher and better life in every sense of the word. Dr. Davies is no pessimist, but believes in greater progress, greater prosperity, both materially and morally, than anything that the world has yet realized.

The fourth speaker was Charles B. Adamson, the topic "The Twentieth Century Manufacturer: What Are His Obligations to the Trade?" His address was most interesting and made a very happy impression. It was the opinion of a good many that in future gatherings of this kind Mr. Adamson will be heard from again.

The last speaker on the list was Charles W. Asbury, the topic, "The Twentieth Century Woman," a subject which the speaker handled with delicacy, and yet with a keen analysis, closing with a beautiful tribute to wifehood and motherhood in the true home life.

Brief addresses were also made by W. W. Supplee, R. R. Williams and James H. Kennedy, which concluded one of the most delightful entertainments of the entire series during the life of the association.

Gustav Zabel has sold out his Hardware, Stove and Farm Implement business in Odessa, Wash., to Barney & Michaelsen, who continue at the old stand.

Kansas Retail Hardware Dealers' Association.

THE Kansas Retail Hardware Dealers' Association held its third annual convention on January 14 and 15 at Kansas City, Kan. The meetings were held in the parlors of the Allmon House.

The first session was called to order by the president, Frank Rudy, of Paola. After the roll call the minutes of last year's convention, held at Topeka, were read and approved.

The president then appointed Oscar Roehr of Topeka, W. H. Foucht of Topeka and James H. Hamilton of Arkansas City as an auditing committee.

The Good of the Association.

The members were invited to give their views regarding what might be done for the good of the association, and W. H. Foucht of Topeka replied with some remarks advising the members of State associations to combine and throw their influence to the manufacturers and jobbers who would promise to work against the barb wire and the wire nail trusts. He also said:

If all Topeka Hardware dealers should combine they could get lower freight rates—could get Kansas City rates in fact. If our Topeka dealers should ship every carload of Nails over the Union Pacific the other freight agents would look into the thing, and would make lower rates.

James H. Hamilton of Arkansas City followed, advising co-operation among dealers, and speaking hopefully of the possibilities of the Interstate Retail Hardware Dealers' Association.

President Rudy

then read his annual address, from which we make the following extracts:

In presenting to you my second annual report, I wish to say that it should be a rule of this association that no one should hold the office of president but one term, and hope such a clause may be inserted in our by-laws before the close of this meeting.

To some it may appear upon the surface that there has been but very little work done in the past year, but if you go below the surface and study some of the association's problems, you will see that our work has not been in vain.

What we need in Kansas is a greater interest in the work by several hundred dealers who are not members of any association. Some of our sister States have expended large sums in getting members interested. Can you afford to neglect your interests at this time? There are many striving for the dollar you are after, and unless you protect yourself the other fellow will get the lion's share of what is justly yours. If we work unitedly and counsel together as to the ways and means to eradicate some of the evils of our business the time will be short until we get justice from jobbers and manufacturers.

This has been a prosperous year in our State. In many respects it has never been equaled. The efforts we have put forth have been well repaid, and when another year has rolled around we may be able to see more of what the future has in store for the retail Hardware dealer.

Secretary's Report.

J. A. Cole, in his report as secretary, alluded to the formation of the Interstate Retail Hardware Dealers' Association.

In March about 1000 letters were sent out to Kansas Hardware dealers, inviting them to join the association, and several new members were secured in this manner, but not as many as it was expected. He laid this partly to the good times, which had made the Hardware dealer hustle so that he had very little time in which he could consider the benefits which might be gained by joining. He went on to say that but one complaint had been received during the year, and that was against an implement jobbing house outside of the secretary's jurisdiction. This was referred to Vice-President Anderson of St. Marys, who is also a member of the Implement Dealers' Association.

Mr. Anderson's Paper.

George F. Anderson of St. Marys presented the first paper to the convention. It was entitled, *Some Wrongs That Need Righting in the Hardware Business.*

After referring to the necessity of cultivating the friendship of competitors instead of watching them with jealous eyes, he said:

Let us speak for a moment of the wrong of selling staple goods without profit. Figure the actual cost of doing our business and ascertain our cost by adding together the items of rent, fuel, light, insurance, taxes, interest on the capital and a reasonable salary; calculate the per cent. this is on the amount of business we do; and how many of us are able to add that per cent. to the laid down cost and not have the price thus obtained more than we can get for Barbed Wire, Nails, Poultry Netting and numerous other of the staple articles without getting any of a small percentage of profit we should have in addition to this actual cost. This is wrong. Every article should bear its percentage of the burden of expense.

In referring to department store competition Mr. Anderson suggested that "might not the putting in of a neat spice department, in which spices are sold on a Nail profit, tend to right this wrong?"

He then went on to say:

To-day perhaps one of the most glaring wrongs is the sale, by the manufacturers, of standard brands of Mechanics' Tools to large department stores, and catalogued by them as leaders, at wholesale prices or less. The speaker recently had brought into his store, by a carpenter, a list of 18 Tools that he wanted to buy. He had made up the list from the catalogue of one of the catalogue houses, and wanted our prices on them, as he was not in immediate need of them, and as part of them were goods we did not carry, we asked him to make a list of his wants in order to get prices on the lot. We had the list priced, on all the items that were of standard makes, by two of the leading Hardware jobbers of the United States, and found that their prices were in some instances more than the price of the catalogue house, the average price being about the same. The result was that we could not obtain prices on all the specifications and so lost the sale.

HOW TO RIGHT A WRONG.

The retailer and the jobber must right this wrong by compelling the manufacturer to have his goods, when sold to catalogue houses, listed at a price that affords some profit to the seller, or the retailer must buy at jobber's price from manufacturer, or drop those lines of goods. For myself, I am adopting the latter course. Years ago my display case of Saws held a full line of a well-known brand of goods; to-day I sell one of that brand only when compelled to, and that is very rarely.

After the paper was presented a discussion was indulged in and Oscar U. Roehr of Topeka, W. A. Plank of Armourdale and J. A. Cole of Topeka spoke.

TUESDAY SESSION.

The president appointed a Committee on Resolutions, consisting of James H. Hamilton, Arkansas City; S. J. Gilbert, Arkansas City, and T. H. Kiniry, Beloit.

A secret communication from President Z. T. Miller of the Interstate Retail Hardware Dealers' Association was next read. This was followed by

James H. Hamilton's Paper:

Competition in the Hardware Trade.

He said in part, in speaking of the Hardwareman's competitors:

On one hand he has great monsters—the mail order houses, the department stores and the jobbers who will sell to a country boy as cheaply as to a dealer. On the other hand, he has the leech and microbe kind—the grocery store trade, the dollar, dime and nickel racket stores, the baking powder and furniture polish gift enterprises, easy payment furniture stores, selling Stoves on the installment plan; second-hand stores, lumber yards selling items of Hardware, Range peddlers and farmer agents. Is it any wonder that it requires exertion to exist? There is no business with which I am acquainted that has so many insidious competitors.

Yet there are some who think anything is fair that will down a competitor. Nails at 3 cents, when they cost 4. Loaded Shells at 35 cents, when they cost 40. Barb Wire at 3½ cents, when it costs more. And if I cannot sell a stove at a profit my competitor shall not. This is poor business policy, even should you win.

Price cutting never leads to financial success. In your own mind just recall a few of the most prosperous dealers in different lines of trade. Inquire into their manner of doing business. You will find that they are not price cutters. In a certain community there will be just about so many goods sold in a year.

Because you are cutting the price of Nails does not induce a laborer or merchant to build a new house, or because you cut $5 on a Steel Range does not induce a farmer to throw away a good looking Cooking Stove in order to buy a new one from you. No, sir; he should rather pay a Range peddler $69 for one than to pay you $45.

What I have said is intended to apply only to regular dealers, in competition in staple and standard goods. Each one must treat grocery and racket store trade as he may deem best; their goods are generally of inferior quality. The grocery store trade I consider contemptible and illegitimate on their part, and I will not buy groceries from one who does it. But the less attention the dealer pays to them the better, as we cannot get their trade from them. They have a cinch on the farmers, who must buy their cheap wares from them in order to get anything for their produce. As to the racket store trade, the only way to combat them is for all the dealers in the town to meet their prices, and they will soon quit.

We have had several strong attempts to establish large racket stores in our city, and, although backed by good men with plenty of capital, they have had to pull out.

Our meanest competitors at home are the easy payment furniture houses, selling Stoves on the installment plan, and these so-called second-hand stores selling new, cheap goods, and the lumber yards that sell Nails, Roofing, Cresting, &c., to their customers. For these blood sucking leeches I know of no remedy but to treat them as serpents; whenever you see a head, crush it if you can.

You are all acquainted with the gift enterprise of the baking powder, furniture polish and soap manufacturers. You have seen whole loads of Enameled Ware, Roasting Pans, Carving Sets, Butcher Knives, Toy Wagons, &c., given away to induce people to pay a big price for an article otherwise not worth a penny.

But there are some honorable dealers in other lines of goods who so far forget their honor in business, and the rights of others, that they will make such gifts, as the dry goods merchant giving away Scales, the clothing dealer giving away Sleds, Boys' Wagons, Slates, &c., with every suit of boys' clothing.

It seems that nothing is suitable for gifts excepting in the Hardware line.

Mr. Walters' Paper.

J. M. Walters of Robinson prepared a paper entitled *Trials of the Country Merchant.* This was read by Oscar U. Roehr. The competition of the mail order houses selling inferior goods was pointed out, and instances told of customers who had been stuck by mail order concerns wanting their purchases exchanged for articles of staple quality in his store.

Mr King's Paper.

W. H. Foucht of Topeka followed by reading a paper on *The Jobbers and Retail Dealers—Their Relations to Each Other,* which had been prepared by E. J. King of Logan. From it we make the following extracts:

The jobbers and retail dealers are suffering alike at the hands of the catalogue house and department stores.

The catalogue house has taken "Uncle Sam" into partnership, and he has proven a valuable ally. He goes direct to the house of the consumer.

In the winter time he sits by the fireside with the family, and with no one to "hinder or make afraid," explains all about the goods and makes it plain that they would better make their purchases under the seal of Government. When the older heads are busy he takes the boys and girls aside and tells them all about the Guns, Bicycles, Games and other things pleasing, and suggests that they become an independent purchaser. In the summer time he goes with the family to the shade of the trees and enjoys the cooling breeze, while he endeavors to show them how he can make a dollar go further than the home dealer. So the order is made out. They only intended to buy a few items, but so many things appear that were useful and needed that it lengthened into pages, and "Uncle Sam" succeeded in taking a nice bill from the home merchant, who is doing them so much good.

The department store man works on an entirely different plan.

He calls the purchaser away from home and its restraining influences.

He takes him into the big store building and shows him the "real thing."

He has told him, through the local papers, how he can buy a Granite Coffee Pot or a linen towel cheaper than of the dealers around the corner. Then he proceeds to show him around the store.

Piles of goods are on every hand, displayed to the best possible advantage.

Here is a special bargain and there a special bargain, and so on, until he, catching the fever, begins to buy like those about him, who are crowding to be waited on, and ere long he is loaded down with goods and has parted with his money, and the Hardwareman and the clothier and the dry goods man, nor even the butcher, have felt the energizing influence of a customer.

The interest of the jobbers and retailers being mutual, would it not be well for us to get closer together?

The jobber is in touch with the manufacturer, and, supported by the retail trade, can do much toward controlling the distribution of the products of the factory.

While I do not think it possible to do away with department stores and catalogue houses, the jobbers can insist that they be put into a class by themselves and get such prices as will give the retailer a chance for his life. With rare exceptions the jobber can make us as good prices as the manufacturer will, and we can buy in smaller quantities.

My opinion is that if we can buy the goods right and are willing to sell on a small margin, we can hold a good share of our trade. Sending away for goods is something the people will tire of and will go back to the local dealer if his prices don't compel them to send away. Therefore, let us ask the jobber to help us overcome our common enemy by selling us goods on a smaller margin, and see that we always get the right prices.

Officers of the Association.

The following officers were elected for the year:

President, Geo. T. Anderson, St. Marys.

Vice-President, Oscar U. Roehr, Topeka.

Secretary-Treasurer, J. A. Cole, Topeka.

Executive Committee: James H. Hamilton, Arkansas City; E. J. King, Logan; T. H. Kinery, Beloit; J. M. Walters, Robinson; F. W. Bartlett, Kansas City.

George F. Anderson, Arkansas City, on motion of James H. Hamilton, was elected delegate to the Chicago conference of the Interstate Retail Hardware Dealers' Association.

Resolutions.

Appropriate resolutions of thanks were adopted, and also the following relating to catalogue houses:

Resolved, That we condemn the action of manufacturers of standard makes selling their stock to catalogue houses, to be listed at prices that do not afford a small retail profit; that we all pledge our best efforts to the success of this association, to the end that some of the wrongs that daily surround us may be righted.

Place of Meeting.

The selection of place for the next meeting was left in the hands of the Executive Committee and the convention adjourned.

Reduction in Freight Rates; New Classification on Manufactured Iron.

A MATTER of special interest to Hardwaremen and iron and steel merchants is the new freight tariff on manufactured iron, particularly that governing from Pittsburgh territory. Heretofore the rate on similar class freight has been 15 cents per hundred pounds in carload lots in summer and 18 cents per hundred pounds in car lots in winter, from Pittsburgh to New York. No reduction in the rate was made last summer as had been customary, the winter rate being uniformly maintained. A new special iron tariff has been agreed on by the Trunk Line Freight Committee of the Trunk Line Association, which is to become effective February 1 next, making a uniform rate on such goods as are in this special schedule, of 13 cents a hundred pounds in car lots and 16 cents per hundred pounds in less than car lots, from Pittsburgh and Buffalo on east bound shipments, which will govern traffic over the various Trunk Lines in this association. This will cover many goods that heretofore have been in fourth, fifth and sixth classes, among them Nails, Spikes, Bar Iron and goods of this general character largely made in Pittsburgh territory. The rate for this class over the Pennsylvania Railroad to Philadelphia from Pittsburgh will be 1 cent per hundred pounds less than to New York, and from Pittsburgh to Baltimore, 1½ cents per hundred pounds less than to New York. Steel Billets, Pittsburgh to New York, will be $2.40 per gross ton and Pig Iron $2.20 per gross tone. The new classification and tariff will be obtainable next week from the different railroads in this association.

Requests for Catalogues, Quotations, &c.

A. G. FLETCHER, Keeseville, N. Y., has added another floor to his Hardware department, and will carry a more extended line and a larger stock of Hardware, including Builders' and Heavy Hardware, Mechanics' Tools, Enameled Ware, Paints, Glass and Oil, Farming Tools, Wooden Ware, &c. He will be pleased to receive catalogues and quotations from manufacturers and jobbers.

Finger & Pickens, Charlotte, N. C., have engaged in business as dealers in Hardware, Stoves, Tinware, &c., making something of a specialty of Builders' Hardware. They will be pleased to receive catalogues, price-lists and quotations from jobbers and manufacturers.

Jas. A. O'Neil & Son, Henderson, N. C., will be pleased to receive catalogues, price-lists and quotations relating to their business. They are dealers in Carriage, Shelf, Builders' and Heavy Hardware, Iron and Steel, Steam, Gas and Water Fittings, and handle also Wagon Wood Work, Paints, Oils, &c.

Farwell, Ozmun, Kirk & Co.'s Fourth Annual Banquet.

FARWELL, OZMUN, KIRK & CO., St. Paul, Minn., entertained their employees at the fourth annual banquet of this character at the Ryan Hotel, in that city, January 3. With the exception of a few absent on account of illness, and some of the Pacific salesmen who were unable to come in, all their force of 250 were present. Music was furnished by an orchestra and the Metropolitan Quartet. R. A. Kirk, president of the company, who also acted as toastmaster, made the opening address. A number of interesting speeches were made by members of the concern and others belonging to the force, among whom were C. H. Bigelow, who spoke upon the old century and the new century. Allan Ter Busch was selected by the salesmen to respond to the toast assigned to them. A. J. Brown, one of the salesmen, paid a feeling tribute to E. B. Kirk, who is now convalescent from a serious illness, and moved that a vote of sympathy be extended to him with wishes for his complete and speedy recovery, which was done. Other addresses were made by F. W. Hurty, secretary of the company, and C. D. MacLaren, credit man of the house, who responded humorously and entertainingly. Among the serious things he said were that when he became identified with the house in June, 1883, there were 30 employees in the store force and six traveling salesmen. No marked increase in the volume of business was shown up to 1895, since which time there has been an enormous increase, particularly in the last three years. The employees had increased 700 per cent. in number since he began and the sales had increased 600 per cent.

George W. Trout & Co.

GEO. W. TROUT & CO., wholesale Hardware merchants, 174 and 176 Lake street, Chicago, are making preparations to handle a much larger business this year. They have added considerably to their force of employees, both in the store and on the road. They will have 22 traveling salesmen in the country and three looking after city trade in Chicago, all of whom will represent this house exclusively. The firm engaged in business in Chicago a little over eight years since in a very modest way. For the first six months the members of the firm did their own traveling, going out alternately, and then decided that their volume of business warranted the engagement of one man as a traveler. He is still with the house. From that time their business has been steadily growing. They were never more impressed by the good outlook for business than now, and intend to make 1901 a banner year.

THE trade will observe among the Special Notices the call for an experienced Hardwareman to compile a new catalogue for a Western jobbing house. The opportunity is deserving the attention of those who are in position to do the work suggested, and we understand that it may possibly lead to a permanent position.

Price-Lists, Circulars, &c.

THE UNITED STATES EDGE TOOL COMPANY, Cattaraugus, N. Y.: Supplementary catalogue devoted to Axes. Photographic reproductions are shown of a variety of patterns of Single and Double Bit Axes, also of Turpentine, Spanish, Ice and Fire Axes.

MICHIGAN VAPOR STOVE COMPANY, Grand Rapids, Mich.: Catalogue of Casters. Illustrations and list prices are given of Grand Rapids, Michigan and Philadelphia patterns of Furniture Casters and Sockets.

F. E. MYERS & BRO., Ashland, Ohio, have issued four catalogues relating to their different lines, as follows: Force, Lift, &c., Pumps; Haying Tools, including Hay Carriers, Forks, Pulleys, &c.; Spray Pumps, and Power Pumps. The catalogues are copiously illustrated.

WALTER COLEMAN & SONS, Providence, R. I.: January, 1901, catalogue relating to Tackle Blocks, Iron and Lignumvitae Sheaves, &c. The manufacturers state that since issuing their last catalogue they have added largely to their line, especially in the variety of Blocks adapted to the yachting trade. The catalogue contains 80 large sized pages.

C. D. ROUNDS, 1047 Niagara street, Buffalo, N. Y.: Illustrated catalogue devoted to the Michigan Refrigerators, for which he is manufacturers' agent.

Trade Items.

UNION MFG. COMPANY, New Britain, Conn., having purchased the tools, fixtures and machinery, and, in fact, the entire plant and good will of the Derby Plane Company, have moved the same to their factory at New Britain, where they will, as soon as possible, commence the manufacture of Wood and Iron Planes. Their aim will be to put on the market Planes of a high quality, fully guaranteed as equal to any. They intend to add to the line from time to time such Planes as the trade may demand. With their record as manufacturers in other lines, they hope to merit the approval of the trade and receive a share of their business in this new departure.

ANNOUNCEMENT is made that on January 1, 1901, the corporation name of Tate Wire Cord Company, Malden, Mass., was changed to Gould Wire Cord Company. The officers of the corporation are: W. E. Harding, president; Albert S. Gould, secretary; S. A. Gould, treasurer and manager.

THE DILLON-GRISWOLD WIRE COMPANY, Sterling, Ill., advise us that the destruction of a warehouse by fire on January 19 will not interfere with shipments. Their mill was not damaged and is running night and day.

J. H. WILLIAMSON, business manager Viennot's Advertising Agency, finding it necessary for the convenience of his clients and others to be centrally located, has removed his New York office from 127 Duane street to Room 719, Temple Court.

H. D. LANFAIR, Springfield, Mass., manufacturer of the Anchor brand Hack and Butcher Saw Blades, Saw Frames, &c., has appointed Allerton-Clarke Company, 97 Chambers street, New York, general agents. Mr. Lanfair has had a great many years' experience manufacturing this class of goods. The Saws are said to be made from the finest quality hot rolled tool steel. The teeth have improved irregular set, which causes them to run smooth and cut very fast. They are tempered evenly throughout, are exceptionally tough and hard to break. The Butcher Saw Blades are made from the finest quality of steel, tempered, polished, set and filed ready for use. They are put up in coils of 50 feet or in lengths from 12 to 28 inches. He also makes the Anchor Hack Saw Frame, in sizes 8, 9, 10 and 12 inch, together with the Lanfair Saw Punch, used for punching the end holes in Butcher Saw Blades, so that Blades of any length can be cut from a coil and fitted to rigid Frames.

Retail Merchants' January Buying.

A number of letters have been received from Hardware merchants relating to goods which they are in the habit of buying in the month of January. Many miscellaneous goods are naturally purchased in this month, but this article refers especially to season goods for spring and summer trade.

In connection with this general subject the following points mentioned by our correspondent are to be noted:

STOCK TAKING.—Some merchants use the memoranda made during stock taking as a basis for replenishing their assortment of shelf and miscellaneous goods, including Builders' Hardware, Mechanics' Tools, &c.

VARYING REQUIREMENTS.—Requirements, in season goods especially, naturally differ with the location and the class of trade transacted by the merchants. In the South, spring work, for example, commences earlier than further north, and it is necessary to have goods in stock sooner.

EARLY PURCHASING.—Progressive concerns generally make it a rule to place orders for season goods early, finding that in this way they can buy more advantageously. The goods are bought, to be delivered somewhat before the time when the actual demand is expected to commence.

REGULAR BUYING.—Many of our correspondents make it something of a rule to buy season goods at a certain time in the year, unless there is something very unusual in the condition of the market. Others are obviously much less bound by any rule in the matter and place orders when, on the whole, the market seems to warrant it.

TARDY BUYING.—It is evident also that a good many buy goods just before the season opens and the demand sets in, often then placing rush orders with jobbers, when a little more foresight on their part would have enabled them to do better from the manufacturer or jobber, as the case may be.

January Purchasers.

Our correspondents mention the following goods as usually bought by them in January:

Bicycles,
Binder Twine,
Buggies,
Cross Cut Saws,
Cultivators,
Farming and Garden Tools,
Fencing Wire,
Fishing Tackle,
Game Traps,
Ice Cream Freezers,
Lawn Hose,
Lawn Mowers,
Nails,
Oil Stoves and Ranges,
Paint Stock,
Painters' Supplies,
Paris Green,
Picks and Mattocks,
Poultry Netting,
Refrigerators,
Screen Doors,
Screen Wire Cloth,
Scythes,
Shelf Hardware,
Shovels and Spades,
Sporting Goods,
Stoves,
Tinware,
Trace Chains, &c.,
Harness,
Wagons,
Wheelbarrows,
Window Screens.

Spring Goods Purchased in November or December.

Many of the larger and more enterprising merchants place orders, usually with manufacturers, but sometimes with jobbers, for the following goods, in December or even November:

Poultry Netting,
Screen Doors,
Window Screens,
Wire Cloth.

January Preparation for Buying.

Other merchants make it a practice in January to sound the market on many spring and summer goods. Quotations are thus obtained from both manufacturers and jobbers, though the former are conspicuously favored by the larger retailers.

WHAT THE TRADE SAY ABOUT JANUARY BUYING.

As indicating the way in which the whole subject of January buying, especially in spring and summer goods, is regarded by the trade, we give the following *résumé* of the substance of letters in which the matter is touched upon:

A Massachusetts merchant always makes it a point as soon as stock taking is completed to make up a memorandum of such goods as are wanted in their respective seasons. Farming Tools of all kinds are ordered for February delivery, Paint stock and Painters' Supplies to come in March, Lawn Mowers and Garden Hose to be shipped in April, Window Screens and Screen Doors to arrive May 1, and such articles of Shelf Hardware as are ordered in case lots. As a rule better prices can be obtained by early orders than later, when the rush is on. The satisfaction of having the goods when wanted offsets the interest on the money.

Farming Tools, Paint Stock, Painters' Supplies, Lawn Mowers, Garden Hose, Window Screens, Screen Doors, Shelf Hardware.

A Pennsylvania Hardware company write that their January buying depends largely upon the condition of the market. This year they are buying as few goods as possible, and the same was true of a year ago. Two years ago they stocked up all around, as they usually do when prices are low. They generally buy Garden Tools, Lawn Mowers and Scythes in December and January.

Garden Tools, Poultry Netting, Lawn Mowers, Scythes.

From a Minnesota merchant we learn that he buys what general goods he needs in January, also Screen Doors and the following season goods: Fishing Tackle, Screen Doors, Poultry Netting, Screen Wire, Wagon Grease, Bicycles and Paint Brushes. Quotations are obtained at this time on Refrigerators and Ice Cream Freezers. But the last few years, he remarks, there has been no great need of buying so far ahead, as fast freight and numerous traveling men afford the opportunity of buying and getting goods as cheaply at the time they are needed.

Poultry Netting, Screen Wire, Fishing Tackle, Bicycles, Paint Brushes, Wagon Grease.

A New Hampshire dealer writes that in January he usually buys his stock of Steel Goods, Nails, Poultry Netting, Wire Cloth and Barb Wire.

Nails, Barb Wire, Steel Goods, Poultry Netting, Wire Cloth.

A merchant in Arkansas in January buys what Shelf Hardware, Tinware, Planes of all kinds, Single Trees, Hoes, Mattocks, Shovels, &c., he needs. Season goods ordered at this time include Screen Wire and Poultry Netting; in fact, he is always on the outlook for future buying. He gets quotations from jobbers before buying goods and makes the best contracts possible.

Shelf Hardware Shovels, Tinware, Mechanics' Tools, Single Trees, Poultry Netting, Screen Wire,

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A Louisiana company buy their stock of Nails, Barb Wire, Builders' Hardware, Steel Goods, Lawn Mowers, Wire Cloth and Refrigerators in January. The reason that they generally purchase these goods in January is that the season opens up early and it requires time to get the goods, so that they have to buy early to be in time for the spring trade.

Refrigerators, Steel Goods, Nails, Builders' Hardware, Barb Wire, Lawn Mowers, Wire Cloth.

A firm in Indiana do not, as a rule, buy any particular line of goods in January, excepting Fencing Wire and Nails. Early in the season, however, which is sometimes in December, they buy such goods as Wire Cloth, Poultry Netting, Screen Doors, Window Screens, Steel Goods. Generally, however, they buy goods when they need them and in such quantities as they think the demand justifies. They anticipate their wants as foresight dictates and in sufficient time to enable the goods to arrive before the stock is exhausted. They have no unchangeable rule for buying, but are governed by circumstances and the markets.

Wire Cloth, Screen Doors, Steel Goods, Fencing Wire, Nails, Poultry Netting, Window Screens.

A company doing business in Massachusetts generally purchase in the fall or early winter Wire Cloth and Poultry Netting, as they can usually get better figures, but sometimes make a mistake. Their experience is that Nails are generally the lowest at this season, as building is at a standstill; when spring opens they are liable to move up. Grass Seed is nearly always the cheapest at this season. Garden and Vegetable Seeds, if a merchant does not have them grown for him, should be purchased in August or September, as they are nearly always from 10 to 25 per cent. higher after January 1. They purchase their Farm and Garden Tools in the fall, not that they save money by so doing, but it is desirable to get all heavy and bulky goods in and stored away during the winter when business is dull, thus saving labor and confusion in the busy season.

Nails, Farming Tools, Grass Seed, Vegetable Seeds, Wire Cloth, Poultry Netting.

A New Jersey firm always find, after the annual stock taking, quite a number of spaces on their shelves, and Shelf Hardware and Mechanics' Tools are ordered. In January they generally place their order for Poultry Netting, Wire Cloth, Lawn Mowers, Ice Cream Freezers, Barb Wire, Nails, Wheelbarrows, Garden Tools, Refrigerators, Oil Stoves, &c. They rarely ask for quotations until they are ready to buy. Situated as they are in convenient reach of New York and Philadelphia, they are in close touch with traveling men from both cities, who keep them pretty well posted, and by watching *The Iron Age* they find they do not go far astray.

Lawn Mowers, Barb Wire, Wheelbarrows, Refrigerators, Shelf Hardware, Poultry Netting, Ice Cream Freezers, Mechanics' Tools, Wire Cloth, Nails, Garden Tools, Oil Stoves.

An Alabama Hardware company buy in January Fishing Tackle, Sporting Goods, Ice Cream Freezers, Refrigerators and Eye Hoes. They also keep up their stock of Locks, Strap and T Hinges, Shovels, Spades, Manure Forks, Potato Diggers, Plow Goods and Eye Hoes.

Refrigerators, Eye Hoes, Fishing Tackle, Sporting Goods, Ice Cream Freezers.

A Delaware Hardware concern include in their January purchases Screen Wire, Poultry Netting, Nails, Horseshoes, Carriages, Wagons, Refrigerators, Ice Cream Freezers, Harness, Saddlery Goods, Bar Iron and Steel. They think it is a good time to buy and will fill up their stock as soon as goods and prices are satisfactory. When they are in need of any of the above goods they make an exception as to the time of buying them.

Carriages, Wagons, Bar Iron and Steel, Refrigerators, Screen Wire, Poultry Netting, Ice Cream Freezers, Nails, Horseshoes, Harness, Saddlery Hardware.

A Hardware company in Maine find a good time to buy general goods is as they pass through the stock in taking inventory. In December or January they order Screen Doors, Screen Cloth, Window Screens, Poultry Netting, Shovels, Steel Goods, Barb Wire, Nails and Ice Cream Freezers. They get quotations on Sheathing Paper, Sash Weights, Glass, Iron and Steel, and, in fact, go over the stock generally.

Poultry Netting, Screen Cloth, Screen Doors, Window Screens, Ice Cream Freezers, Nails, Barb Wire, Steel Goods, Shovels.

A Michigan firm buy Steel Goods, Wire Cloth, Poultry Netting, Screen Doors and some smaller articles in or about January of each year for future shipment. They always buy Sash and Doors in December or January, as at that time, there being only a light demand, prices are always the lowest of the year and concessions can be then obtained that cannot generally be had at any other time. Other goods they buy as they need them, except when prices are exceptionally low, at which time they load up on what they consider low in price.

Sash and Doors, Screen Doors, Poultry Netting, Wire Cloth, Steel Goods.

A Maryland firm generally try to buy all goods that their January invoice shows they are short of in the general Hardware line. They contract for Implements that have not already been contracted for. They buy the summer goods they handle in January or before, including Fly Nets, Summer Lap Spreads and Screen Wire Goods. Such goods as are fluctuating in price they try to catch when the market is off. Some goods are bought and contracted for with price guaranteed against a decline, with the privilege of factory meeting the decline or canceling the order.

Summer Lap Spreads, Wire Screen Goods, Fly Nets, Implements.

An Illinois merchant remarks that January is a dull month for both selling and buying; that it is the time for settling accounts, taking inventory and preparing for spring business. He buys in January only as occasion requires. The goods called for are Nails and Iron, Horse Nails and Horseshoes, Coal Miners' Goods, Ice Tools, Snow Shovels, Sled and Cutter Stuff. Most of his spring and summer goods are contracted for previous to January. Occasionally he buys Wrenches, Oilers, Belting, Wood Rakes and Snaths as late as January.

Wrenches, Oilers, Belting, Wood Rakes, Snaths.

Edward Darby & Sons' Fire.

EDWARD DARBY & SONS, Pennsylvania Wire Works, Philadelphia, Pa., suffered from a disastrous fire on the 20th inst. The Wire Cloth, Wire and Iron Working department, located in the rear of 113-115 Bread street, was entirely destroyed. They will rebuild on the same site, using temporary quarters until completion of the building.

No great delay is anticipated in filling orders on hand for the line of goods manufactured in the burned building. No cause can be assigned for the conflagration. Darby & Sons estimate their loss at $35,000, fully covered by insurance. The flames also communicated with F. M. Borden & Bro.'s Stove warehouse, 118-120-122 North Second street, and destroyed the upper floors and damaged their large stock of Stoves, Ranges, &c., by water. C. E. Porter & Co., 124 North Second street, and Haslet & Flanagan, 116 North Second street, were also damaged by water.

E. M. Potter, dealer in Hardware, Stoves, Farm Implements, Sporting Goods, &c., Basett, Iowa, has been succeeded by Potter & Beard.

British Letter.

FROM A SPECIAL CORRESPONDENT.

Ironmongers' Associations.

AMERICA is well ahead of Great Britain so far as the organization of trade is concerned. Six years ago an ironmongers' association was started in South Wales. Two years passed before a second came into existence and since then the growth of the association movement in the Hardware trade has been slow but sure. A year ago various associations federated under the style of the Ironmongers' Federated Association. Now there are about 50 associations federated to the central body.

The Ironmonger and the Plumber.

An important question raised at the recent Ironmongers' Federated Association Conference was that of plumbers' registration. It is only interesting to American readers in so far as it shows to what extent any trade in this country may become the slave of tradition. There is a strong movement on foot throughout this country in favor of a legislative enactment calling for the registration of plumbers. This registration is to be voluntary, but the plumbing trade is so well organized, both among the masters and the operatives, that as soon as the bill becomes a law action will be taken to confine the plumbing trade entirely to plumbers and so exclude a large number of ironmongers who employ operative plumbers, but who would be excluded if the Worshipful Company of Plumbers were to get its own way.

The act provides for both oral and practical examinations in the craft of plumbing. The applicant, if successful, after paying his fee, goes upon the register and is allowed to add the letters, R. P. (Registered Plumber) after his name. So far, of course, ironmongers can submit themselves for examination as much as plumbers, and many are willing to do so. But the organization of the plumbers is so powerful that at the technical schools, where the necessary theoretical knowledge is taught, only apprentices are permitted to enter. Nor will the operative plumbers recognize as master plumber any man who has not himself served seven years' apprenticeship. As ironmongers are unwilling to apprentice their sons for seven years to a plumber, the outlook is not promising.

But the plumbers have an even stronger argument. The municipal authorities have an authorized plumbers' list. This means that the municipal inspectors will not stamp the plumbing work of anybody not on their authorized list. As municipalities in increasing numbers are now owning their own water works, this means that no ironmonger unless he has taken the precaution earlier to be put upon the authorized list is able to connect up to the mains, to fix plumbing fittings, or in any way to do any form of plumbing through which the water from the public main is passed. Whether it be pure water coming into the house or outgoing waste, the monopoly is reserved for the plumber who takes care to keep off the municipal authorized list, any ironmonger, no matter what may be his plumbing qualifications, who has not himself served his time at the plumbing trade.

Decided Opposition.

The conference, however, wisely decided to use their greatest influence against this bill. It is pointed out that new methods of plumbing are constantly being evolved and that the existence of a monopoly on the lines laid down by the plumbers would mean the killing out of originality. In London at the present time American plumbing can be seen. Those who have studied the differences agree that Americans can teach us in many particulars. Yet if the Plumbers' Registration bill were to become law no American plumber could come over to this country to ply his craft, no matter how high may be his qualification, no matter how excellent his skill. There is also a business side to the question which American exporters should know. It is actually a fact that plumbers are declining to purchase plumbing fittings sold by ironmongers. Thus, if any American wants to sell plumbing goods, he should take care to cultivate the plumber as well as the Hardware trade.

Americans In It.

That it is wise to be on the right side of the association movement in this country was evidenced at the dinner given to the delegates by a number of wholesale houses and manufacturers. A certain number of Americans who are engaged entirely in selling to British traders American goods, were among the hosts.

What Does C. I. F. Mean?

English importers and exporters are just now divided as to the strict interpretation of the term "c.i.f." Does it mean that the seller undertakes to pay all the charges on the goods shipped from port to port? The question has been raised in a practical way: A Manchester merchant bought some goods from a house in Calcutta, to be shipped to Larnica, in Cyprus, the sale notes stating that cost, insurance and freight should be paid by the seller. As the goods came from India, the authorities at Port Said would not allow them to be landed, on account of the Indian plague. They were therefore brought to London, transshipped and finally reached their destination. The question arose, who should pay the extra cost of freight incurred? The seller contended that having put the goods on board at Calcutta in proper condition and paid the insurance premium and the freight to Larnica, his liability ceased. The buyer contended that the acceptance of c.i.f. terms imposed upon the seller the responsibility of discharging all the actual expenses of freight to the port of destination. The dispute was arbitrated, and the decision is in favor of the seller. If, therefore, American exporters sell their goods in this country on c.i.f. terms and any accident happens involving additional costs over and above the first cost of freight and insurance, it would seem that they are not liable for any further charges caused by accident or other untoward circumstance.

A Manchester merchant says that the correct view to take of a c.i.f. transaction is that it resolves itself into a sale of documents and any expense incurred after the steamer has left the home port in no way affects the seller. He further adds that the buyer's only remedy is to purchase on landed terms. Buying on c.i.f. terms is practiced to secure the goods at the cheapest possible price, the buyer taking all risks after shipment has been made.

An Advertising Suggestion.

American manufacturers who desire foreign business will do well always to insert the name and address of their foreign agents in the advertisements. This will obviously aid in establishing connections on this side, as it is then easy for merchants here to get into touch with the goods.

Incandescent Oil Lamps.

I am struck with the large number of advertisements appearing in the American papers of Incandescent Benzoline Lamps, and with the complete absence of anything of the sort over here. The Welsbach Incandescent Gas Light Company, who hold the master patents of incandescent mantles, put something of the sort on the market last year, but for some reason or another it does not appear to have proved successful. Perhaps it was because the lamps were made to use petroleum. But benzoline is on sale in this country in most ironmongers' shops, and, therefore, if the Incandescent Oil Lamps so freely advertised in American papers are as good as their makers say they are, it seems to me there ought to be a sale for them in Great Britain.

Register Quickly.

A recent legal case in Germany points to the importance of owners of trade marks registering them without delay in Germany. It is stated with authority that under the German law priority of right to a trade mark can only be obtained by registration, and the use of a trade mark apart from registration gives no priority of right. Thus, the first person to obtain registration of any trade mark obtains the exclusive use, even against the true owner who has actually used the mark in Ger-

many, but has neglected to register it. There would appear to be a few extra smart Germans who are "on the pounce." They wait their chance and register the trade mark of a British or American trader, who, if he wants to preserve the uniformity of his trade marks, must buy out the enterprising Teuton.

The Simonds Mfg. Company's New Departure.

THE SIMONDS MFG. COMPANY, Fitchburg, Mass., who have had a branch house and factory in Chicago since 1880, erected their own works in that city in 1892, since which time they have made three different additions to their Chicago plant. In 1900 they bought the large lot of land adjoining their property and now own the whole block between Sixteenth and Seventeenth streets on Western avenue in Chicago. The extent of the plant is shown by the accompanying ground plan.

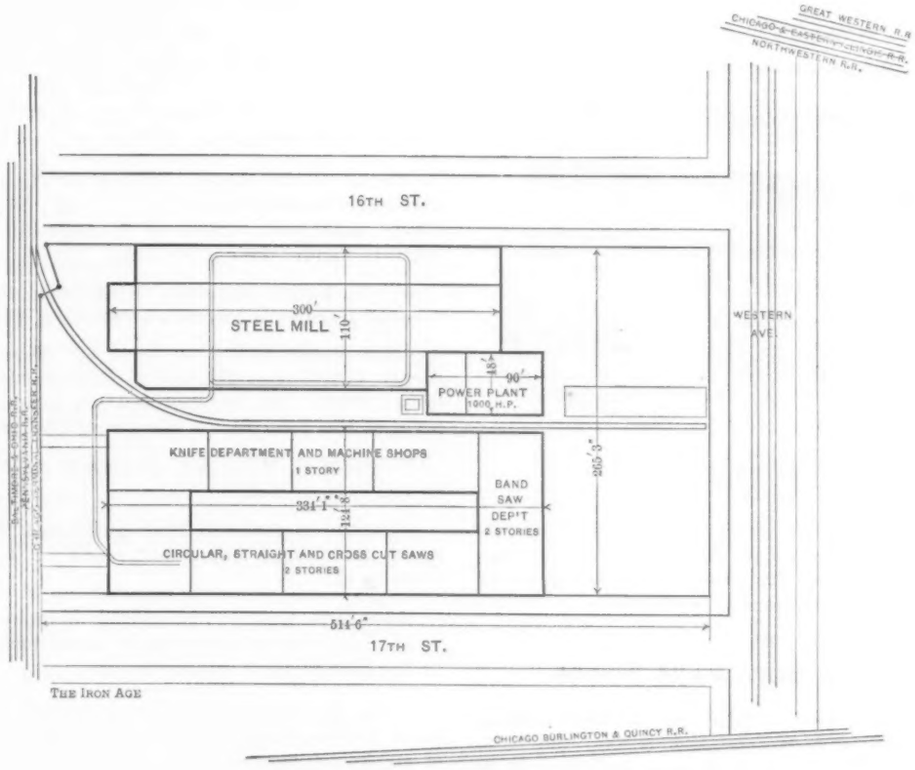
Recognizing the fact that if they could follow the manufacture of their goods from the very beginning of the conversion of the steel to the last touch of the finished product of the Saw they could count on giving a more reliable article, the company have now completed in Chicago a crucible steel plant which was put in operation in December. In this plant they will make all their own steel and in this way are confident that they will make a still better Saw than they have heretofore made. This is said to be the only steel plant operated in connection with a Saw factory west of the Alleghenies.

With skilled men to start this industry, they will be able to improve the quality of their steel, for, by having absolute control of its manufacture, they can put such material into it as will give the best results for their special work. In making this new move the company show themselves to be fully abreast of the times, as they can henceforth get material when wanted and of such a quality as required.

The building erected for the steel works is 110 feet wide by 280 feet long and is in every way equipped with machinery and appliances of the most modern character. Everything is new, and the company claim that it is the best equipped plant in the country for the manufacture of Saw steel. Convenience in handling material has been carefully studied. A side track from the Chicago Junction Railway runs through the center of the Simonds block, so that all material is unloaded in the steel plant. The new power house, just finished, which is 50 x 90 feet, contains a fine equipment of Boilers, Engines and auxiliary apparatus, all of the most approved type.

All the buildings are of brick and stone and are not only substantial, but have been erected with a view to architectural effect. The Simonds Mfg. Company now have a most modern Saw factory and Saw steel plant, the entire Chicago works having been erected within the last eight years. The company for many years past have been progressing steadily, but have made their greatest progress in the last ten years. With their improved facilities they will be able to furnish a larger quantity of goods than ever, and to fill orders promptly and with goods which they can watch from start to finish.

Theirs is the most centrally located Saw plant in the United States, having more trunk lines and lake connections than any other point, and are thus in a position to handle the Saw and Knife business to their satisfaction and to the satisfaction of their many friends throughout the country.



Ground Plan of Simonds Mfg. Company's Chicago Plant.

The company have moved the bulk of their business of manufacturing Crosscut Saws from the Fitchburg plant to the Chicago works. New tools of the very latest and most improved kind have been set up in Chicago for this line, with a duplicate set left in the Fitchburg factory in case of emergency. This company advise us that during the unprecedented rush of last year they were far behind on orders for Crosscuts, although running their works 22 hours a day for a year and a half.

John S. Leng's Son & Co.

JOHN S. LENG'S SON & CO., 4 Fletcher street, New York, with branches at 1964 Broadway and also at Philadelphia and Boston, have issued their 1901 catalogue relating to Bicycle Materials, Sundries and Tools. Included are Bicycle Parts, Saddles, Brakes, Coaster Hubs, Cements, Bells, Lamps, Pumps, Toe Clips, Bicycle

Stands, Carriers, Cyclometers and Tools. The catalogue prices are subject to practically the same discounts as last year. In addition to these goods the firm are agents for the Weldless Steel Tube Company, Birmingham, England; and for the National Automobile & Electric Company, Indianapolis, Ind., makers of Electric Automobiles. The firm have opened a show room at 1964 Broadway, where these vehicles are exhibited.

Bins for Transom Lifters.

THE accompanying illustration shows bins for keeping the retail stock of Transom Lifters, used by Barrett Hardware Company of Joliet, Ill. There are eight bins, each 4 inches high, 10 inches deep and 7 feet long, with hinged fronts to each bin that drop down. The eight bins together are 4 feet high, 10 inches deep and 7 feet long. The company remark that the bins would probably be more convenient if the fronts were

Bins for Transom Lifters.

hinged at the top so as to stand up when open, instead of dropping down as they now do. Otherwise the bins have proved satisfactory for keeping a small stock of eight different sizes of Lifters to retail from.

Among the Hardware Trade.

W. A. Wharton & Son have disposed of their business at Toronto, Kan., to J. K. Tompson & Co., and have opened up at Coyville, carrying a stock including Shelf Hardware, Farming Implements, Wagons, Buggies, Stoves, &c.

Hackney Bros. are successors to J. B. Fuller & Co. in the Hardware business in Comstock, Neb.

A. E. Benedict has disposed of his Hardware and Stove business in Exeter, Neb., to A. V. Brown.

James T. Irwin has bought a half interest in the Hardware, Stove and Agricultural Implement business of F. C. Hayford, Tully, N. Y., and the style is now F. C. Hayford & Co.

The Turner Hardware & Supply Company have succeeded E. D. Turner, Connellsville, Pa.

S. D. Lewis has sold out his interest in the Hardware firm of Dobyns & Lewis, Howard, Kan., and the firm name is now Dobyns, Crooks & Allen.

J. O. Olmstead has purchased the Hardware, Stove and Farm Implement business formerly conducted by Edwards & Co., Richmond, Vt.

Geo. W. Hall has succeeded C. J. Williams, retailer of Hardware, Stoves, Sporting Goods, &c., Rantoul, Ill. Mr. Hall is remodeling the interior of the store and adding to the shelf capacity.

T. B. Shannon, Hardware, Stoves, Vehicles, Plumbing, &c., Iola, Kan., who has materially enlarged his establishment during the past year, now contemplates a further extension of his facilities, which will permit him to devote the entire second floor of his present building to repository purposes.

Ramsay Hardware Company, Ellensburg, Wash., dealers in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c., are erecting a new building, 90 x 90 feet in dimensions, with storage warehouse in rear, 20 x 60 feet. They will add plumbing and tinning to their other lines.

American Range & Hardware Company, Lincoln, Neb., have been incorporated with a capital stock of $200,000. The following are the officers of the company: A. H. Buckstaff, president; S. H. Burnham, treasurer, and W. E. Jakway, secretary. They advise us that 400 Hardware dealers in the States of Nebraska, Kansas, Colorado, Montana, South Dakota and Wyoming are stockholders. The company will manufacture Ranges and Heaters and job Shelf Hardware.

The Woodward & Hill Company, Albany, N. Y., have lately been incorporated with a capital of $25,000. The company are jobbers of Carriage and Saddlery Hardware, Carriage and Wagon Wood Work, &c. The business was established in 1819.

Moehle & Tscharner, dealers in Hardware, Stoves and Farm Implements, Okawville, Ill., have disposed of their Implement stock to C. W. Schmidt, but will continue to handle their other lines.

W. E. Locke, Mankato, Minn., has disposed of his general Hardware business to Smith & Lentz.

John Smith, dealer in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, &c., Waitsburg, Wash., has incorporated his business under the style of the John Smith Hardware Company.

Schrandt & Miller are successors to Nichols & McGraw, Aurora, Neb.

Hannum & Arthaud have purchased the Hardware, Stove and Farm Implement stock of J. F. Marcum, Olds, Iowa.

Twentieth Century Hardware Company, Moorhead, Minn., have erected a two-story warehouse, 25 x 60 feet, in the rear of their establishment.

A. F. Skidmore & Co. are successors to O. S. Skidmore & Co., Oplagah, I. T., wholesalers and retailers of Hardware, Stoves, Farm Implements, Sporting Goods and general merchandise.

G. R. Hardman has succeeded George W. Umphrey in the Hardware, Stove and Agricultural Implement business at Guthrie Center, Iowa.

Gammon & Maring have succeeded Wageck & Son, Ponca, O. T., dealers in Hardware, Stoves, Farm Implements, Sporting Goods, Buggies, &c. The new firm have more than doubled the size of the store.

Kelly & Hill Hardware Company are successors to Jarboe, Woolley & Kelly, Davis, I. T.

Hunt Bros., Shell Rock, Iowa, retailers of Shelf and Heavy Hardware, Stoves, Tinware, &c., have sold out to Stanley & Harmon. The store has been given a general overhauling.

Frank Gardner Hardware & Supply Company, Laurel, Miss., have been incorporated, succeeding Frank Gardner. The company have just taken possession of a new brick store.

Jno. K. Cox has lately removed his stock of Hardware from Moline to Erie, Kan., where he is now located.

The Hardware firm of Good & Hallock, Sheldon, Ill., have dissolved. D. P. Good is successor at the old stand.

H. C. Draughton & Son, Lumber dealers, Davis, I. T., have added a stock of Hardware and Farm Implements.

P. J. McDonald has succeeded Chris. Shern, Cameron, Wis., in the Hardware, Stove and Farm Implement business. Mr. McDonald has enlarged the store and added $500 worth of goods to the stock thus acquired.

R. W. Hatcher has disposed of his interest in the Sandersville Hardware Company, Sandersville, Ga., to H. E. Cohen, his partner, who will continue the business under the same style. Mr. Hatcher speaks Spanish and will go to Cuba to investigate the opportunities offered there in the Hardware line.

C. H. Vincent has disposed of his business in Sioux Falls, S. Dak., to E. W. Hackman Hardware Company, who will put in considerable new shelving and increase the line formerly carried.

Terhune, Gibson & Terhune, Mound City, Mo., have just opened up a new stock, comprising Hardware, Tinware, Stoves, Pumps, Buggies, Wagons, Harness and Farm Implements. They will make a specialty of Builders' Hardware. R. E. Terhune, J. T. Gibson and B. M. Terhune are the members of the firm.

Milan & McIntosh Hardware Company, Chelsea, Ind. Ter., are contemplating the erection of a large new building for their business.

Clark Bros. have purchased the Hardware, Stove and Tinware business of W. H. Chilson, Garwin, Iowa.

E. G. Gard has bought the stock of Hardware, Stoves, Agricultural Implements, &c., formerly carried by H. Pugh, at Troy Mills, Iowa.

Wm. E. Daily has bought the S. A. Sorenson stock of Hardware, Stoves, Agricultural Implements, Sporting Goods, &c., at Dexter, Minn.

On January 1 a new firm, under the style of Mellenthin, Schwepfer & Aron, opened up in the Hardware and Agricultural Implement business in Morgan, Minn.

Weise & Schmidt of Blakeley, Minn., have removed to Lester Prairie, where they have erected a fine new brick building.

M. C. Reed has sold out his Hardware, Stove, Farm Implement, Buggy and Wagon business in Elnora, Ind., to A. G. Coen, who will continue at the old stand.

Meister & Seely have succeeded J. C. Meister in the Hardware, Stove and Farm Implement business in Sterling, Ill.

The store of G. H. Kraft & Son, Asheville, Ohio, was robbed of $50 worth of goods a short time since.

Johnston & Berry, Hardware merchants, Green Camp, Ohio, will shortly remove to new quarters.

Chickasaw Hardware & Implement Company have succeeded Payne & Long, Duncan, Ind. Ter.

Hocker & Whiteford, Guilford, Mo., have been succeeded by Hocker & Core, who will continue the sale of Hardware, Stoves, Farm Implements, &c., at the old stand.

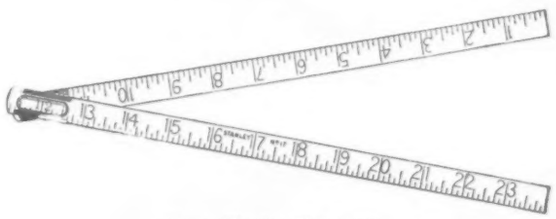
Miscellaneous Note.

A New Sandpaper Enterprise.

We are advised by a Western correspondent that Armour & Co., the famous packers, have established a sandpaper department at Thirty-first and Benson streets, Chicago. Their entrance into this branch of trade was a natural development of their glue business. Other manufacturers of glue also make sandpaper, the two products thus being commercially related. A building has been erected for the special purpose of manufacturing sand paper and emery paper. It occupies a ground space of 60 x 265 feet, with an ell 100 feet in width and the full hight of the building, which comprises five stories and a basement. The sand and emery are prepared in the ell and the paper is made in the main part of the building. The factory is equipped with a full line of machinery of the most improved character, installed under the direction of the superintendent, Edward Richardson. All standard goods bear the name "Armour." The factory has just been completed and started in operation.

Blacksmiths' Rule.

Stanley Rule & Level Company, New Britain, Conn., and 107 Chambers street, New York, are introducing a blacksmiths' rule of their manufacture, 2 feet in length, as here illustrated. It is made with two legs of spring



Brass Blacksmiths' Rule.

brass ⅝ inch wide, with a brass joint similar in design to the joint used in their zig-zag rule. This rule is especially recommended for measuring hot metal, as it can be cooled by plunging it in water without risk of rusting it. The figures run from 1 to 23 inclusive.

Sheffy Automatic Seat.

Chicago Automatic Seat Company, 154 Lake street, Chicago, for whom Coe Mfg. Company, 50 Warren street, New York, are Eastern agents, are manufacturing the Sheffy automatic seat, as here illustrated. It is

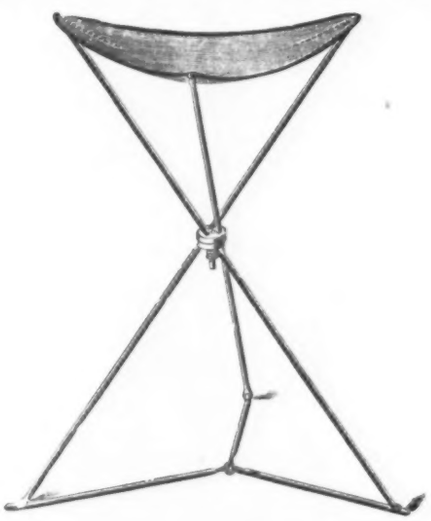


Fig. 1.—Sheffy Automatic Seat, Open.

made of spring steel and canvas and, it is claimed, will hold a person weighing 500 pounds. When closed it is 21½ inches long, with a diameter of 1¼ inches. Its hight when opened is 17 inches. For convenience in carrying it is inclosed in a neat canvas case, seat and case weighing, complete, 19 ounces. It is especially

Fig. 2.—Seat Collapsed for Carrying.

recommended by the manufacturers for parties, excursions, park gatherings, picnics, camp meetings, and, in fact, anywhere that it is desired to take a portable seat. Fig. 1 shows the device opened as in use, Fig. 2 representing it closed, but not inclosed in the canvas case which is sent with it.

The Doran Gasoline Lighting System.

The Acorn Brass Works, 19 to 23 South Jefferson street, Chicago, are introducing a new system of gasoline lighting. Two of the lamps used with the system are herewith illustrated. Fig. 1 shows their regular

Fig. 1.—*Street Lamp.*

street or outside lamp and Fig. 2 their inside style. From a tank the gasoline is conveyed to each lamp through a flexible hollow wire. This wire can be put through crevices or around corners, and can be concealed just as electric wires are. As many lights as desired can be supplied from the same tank. The company claim

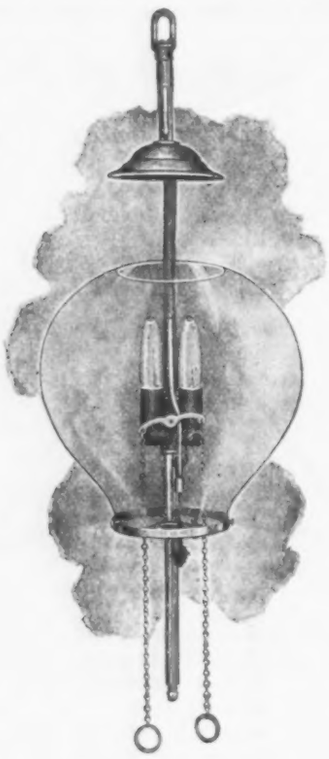


Fig. 2.—*Inside Lamp.*

that there is no danger in thus handling gasoline, as the tanks are tested to a pressure of 150 pounds, and, in use, are never subjected to more than 60 or 70 pounds at any time. The inside of the interior lamp is of aluminum finish. The construction of the light is such that, when it is once put into operation, it is always ready for instant use through the medium of a by-pass controlled by small chains, which are attached to a lever that opens and closes a small valve. When the use of the light is desired, all that is necessary is to pull one of the chains, which opens the gas orifice to its full capacity. When not in use, the light is turned down to a very small flame that is scarcely noticeable, but high enough to keep the generator hot. The generator is placed between the mantles. The gasoline is conducted to the generator, where it is changed to gas by the heat of the flame or the mantles. The generator is the only wearing part of the entire apparatus, is interchangeable, and does not require a skilled person to replace it. The company claim that the light is particularly desirable for places of business, churches and parks. They also claim that the expense of installing and maintaining these lights is much less than with any other system. They furnish each customer with an extra generator. Any mantles similar to the Welsbach may be used. The lamp is 1250 candle-power, and, it is claimed, is more brilliant than either electricity or gas. Several Western cities have had their parks supplied with these lamps, and the manufacturers have been closing many smaller contracts for furnishing halls, places of business and factories.

Austin's Triumph Tea and Coffee Filter.

Austin & Craw, South Norwalk, Conn., are manufacturing the tea and coffee filter shown herewith. The filter is illustrated separately in Fig. 1, and in use in

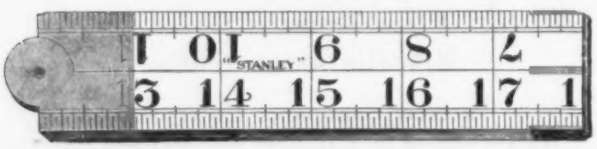
Fig. 1. Fig. 2.

Austin's Triumph Tea and Coffee Filter.

Fig. 2, the pot being cut away in the illustration to show the position of the filter in it. The filter is a cloth bag of special weave, to allow coarse, fine ground or powdered coffee to be used with equally good results. It is made in three lengths to adapt it to any size of pot. The filters are sold separate from pots, and the handle is easily detachable from the bag. The manufacturers claim that the filter insures the making of good tea and coffee quickly and economically; that it can be attached to a pot now in use; that it prevents dripping on the table linen; that clogging of the spout of the pot is avoided; that no time is lost waiting for coffee to settle; that the use of eggs or other means of settling coffee is obviated; and that the bag is easily cleaned.

Stanley's Blindman's Rule.

The Stanley Rule & Level Company, New Britain, Conn., and 107 Chambers street, New York, have put



Stanley's Blindman's Rule.

on the market what they allude to as Stanley's Blindman's rule, an illustration of which is here shown. The rule is made of boxwood and brass mounted, with exceptionally distinct concaved or depressed figures about ¼ inch long, which can be readily seen in poorly lighted or close quarters. It is 2 feet long, 1⅝ inches wide, and graduated in eighths and sixteenths, the figures following in consecutive order from 1 to 23, inclusive.

Acme Basement Window Trimmings.

The accompanying illustrations relate to basement window trimmings offered by the Caldwell Mfg. Company, Rochester, N. Y. The catch shown in Fig. 1 is designed to take the place of a hook and eye for holding

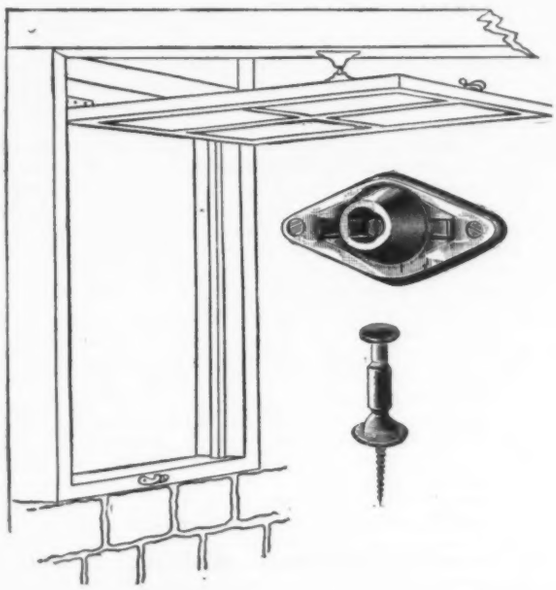


Fig. 1.—Basement Window Catch.

cellar windows open. It is explained that it is only necessary to push the sash up against the catch to make it hold and that a quick pull releases the sash. The fastener shown in Fig. 2 acts as a lock, pressing the sash tightly into the frame. It is also referred to as taking up the slack, preventing rattling, and excludes cold air

Fig. 2.—Basement Window Fastener.

and snow should the sash be loosely fitted. The fastener operates in the same manner on attic and dormer windows hinged to swing. The trimmings are packed in neat boxes, each box containing all the hardware for one window, including butts and screws. They are put up in sets Nos. 12, 13 and 15.

Never Drip Steel Mortar Hods.

The accompanying cut represents steel mortar hods offered by the Cleveland Wire Spring Company, Cleveland, Ohio. A feature of the hods is the manner of constructing the end, which is made of one piece and is so folded as to be water tight. The hods are provided with a socket handle fork and wooden shoulder saddle.

Never Drip Steel Mortar Hods

A cloth may be attached to the under side of the saddle to make easier the carrying. The socket handle permits taking up the shrinkage of handles and the replacing of broken ones. The hods are reinforced at the dumping point and on the edges of the body. The company also make steel brick hods.

Stanley's Pencil Clasp.

Stanley Rule & Level Company, New Britain, Conn., and 107 Chambers street, New York, are manufacturing Stanley's patent pencil clasp, as here illustrated in Fig.

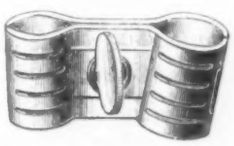


Fig. 1.—Stanley's Patent Pencil Clasp, Exact Size.

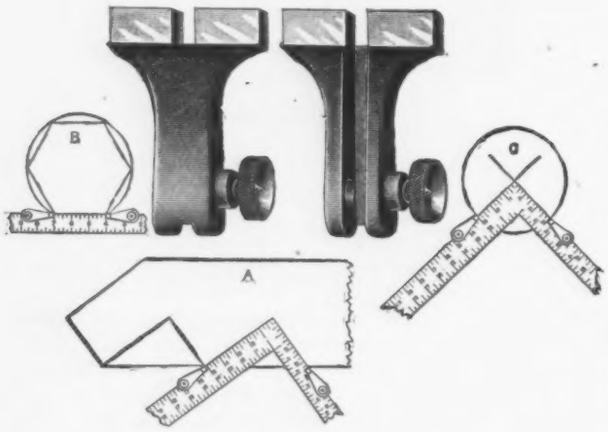
1, full size. It is made of iron, nickel plated, and is designed for use on one leg of a wing divider, the other opening being used to hold a pencil for sweeping circles or other figures, Fig. 2 showing the application of it.

Fig. 2.—Method of Using Clasp.

A turn of the thumb screw simultaneously grips the divider and pencil. The clasps are put up one dozen on an ornamental card, with an easel back, making it suitable for counter or display purposes to sell from.

Stair Gauge Fixtures.

L. S. Starrett Company, Athol, Mass., and 126 Liberty street, New York, have put on the market Starrett's stair gauge fixtures No. 111, as here illustrated. These fixtures, which are nickel plated, can be readily clamped to a carpenter's steel square to form a gauge for various purposes. In size they are 1⅞ inches long over all. The outline sketch in the engraving show some of the various uses to which the gauge can be put. Sketch A shows the

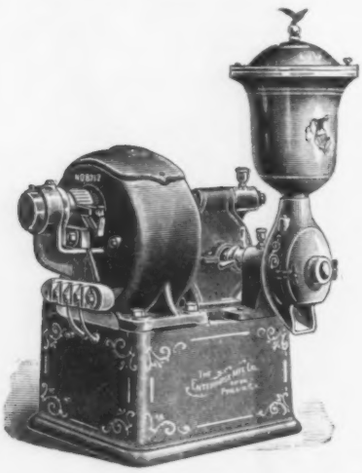


Starrett's Stair Gauge Fixtures.

application of the gauge for laying out a stair stringer; sketch B laying off hexagon angles; sketch C used as a center gauge or in quartering a circle. Especial attention is called to the moderate price, compact form and other advantages not possessed by ordinary stair gauges.

Electrically Connected Rapid Grinding and Pulverizing Mill.

The Enterprise Mfg. Company, Philadelphia, Pa., are putting on the market the mill shown herewith. The machines are fitted with motors for either direct or alternating current, and to suit the conditions existing in any locality. Those for direct current are so constructed as to enable the operator to instantly change the speed from fast to slow, or *vice versa*. The fast speed is intended to be used only when coffee is to be granulated and the slow speed for pulverizing. The motor and mill



Electrically Connected Rapid Grinding and Pulverizing Mill.

have a direct connection, thus reducing loss of power to a minimum, which is a considerable saving as compared with mills run by motor having a belt connection. The mill was designed to meet the demand for one that would either granulate or pulverize, and do so at a minimum cost. Twenty-five pounds of coffee, it is stated, can be ground ordinarily fine for 1 cent. The mills are made in a variety of sizes and styles, and the grinding capacity is from 3 to 10 pounds per minute, according to size.

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Current Hardware Prices.

REVISED JANUARY 22, 1900.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Cut Prices.—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, ₩ doz. $3.00...33⅓@33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent.....25&5%
Taplin's Perfection.....50%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₩ lb 7¼@7¾c
Hay-Budden, Wrought.....9@9¼c
Horseshoe brand, Wrought.....9¼@9¾c
Samson.....₩ lb 7¼@8c
Trenton, Wrought.....₩ lb 8¼@8¾c

Imported—

Armitage's Mouse Hole.....8¼@8½c
Peter Wright's.....9¼@9½c

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....20%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull & Hoyt Co.:
Lots of 1 doz.....25%
Smaller Lots.....20%
Lots of 3 doz.....30%

Augers and Bits—

Com. Double Spur.....70@70&5%
Boring Machine Augers.....60&10&10@70&5%
Car Bits, 12-in. twist.....60@...%
Jennings' Pattern:
Auger Bits.....60@...%
Ford's Auger and Car Bits.....40&10@40&10&10%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list....40%
No. 30. R. Jennings' List.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits 15&10@15&10&5%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (R. Jennings' list).....50%

Bit Stock Drills—

Standard List.....65&5@70%

Expansive Bits—

Clark's small, $18; large, $26.....50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33⅓%
Swan's.....6%

Gimlet Bits—

Common Double Cut..gro. $2.00@2.75
German Pattern.....gro. $3.25@5.00
Double Cut, makers' lists.....50&5&50&10%

Hollow Augers—

Ames.....25&10%
Bonney's Adjustable, ₩ doz.....$15.55
New Patent.....25&10%
Universal.....20%

Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....40%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.10
Unhandled, Shouldered..gro. 63@66c
Unhandled, Patent.....gro. 68@70c
Peg Awls:
Unhandled, Patent....gro. 31@34c
Unhandled, Shouldered..gro. 65@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, best brands $6.25@6.50
First Quality, other brands $6.00@6.25
Jobbers' Special Brands:
Good Quality.....$5.00@5.50
Best Quality.....$6.25
Cheap, Handled Axes.....$5.50@5.75
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—Iron or Steel.

Concord, Loose Collar.....4¼c
Concord, Solid Collar.....5 c
No. 1 Common.....3@3¼c
No. 1¼ Com. New Style...3½@4 c
No. 2, Solid Collar.....3½@3¾c
Nos. 7, 8, 11 to 14 ... .75&10%
Nos. 15 to 18.....60&10&10%
Nos. 19 to 22.....80%

} 5% cash 10 days.

Boxes, Axle—

Common and Concord, not turned..
lb. 5c
Common and Concord, turned..lb. 6c
Half Patent.....lb. 9c

Balances—Sash—Spring—

Spring Balances.....50@50&10%
Chatillon's Light Spg. Balances...40&10%
Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50%
Chatillon's Large Dial.....30%
Peerless.....50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb..
3@3½c

Beams, Scale—

Scale Beams, List Jan. 12, '82.50&10%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters—Egg—

Standard Co.:
No. 5 Steel Handle Dover, ₩ gro. $6.50
No. 10 Cast Handle Dover..₩ gro. $8.00
No. 10 Steel Handle Dover, ₩ gro $8.00
No. 15 Extra Heavy Steel Handle, ₩ gro. $15.00
Rival, ₩ gro.....$10.00
Taplin Mfg. Co.: ₩ gro.
No. 50 Small Family size.....$6.50
No. 100 Regular Family size.....$8.00
No. 102 Regular Family size, tinned.....$9.50
No. 150 Large Family size.....$16.00
No. 152 Large Family size, tinned.....$17.00
Lyon's, Standard size.....₩ doz. $1.75
Wonder (S. S. & Co.).....₩ gro. $7.50

Bellows—

Blacksmith, Standard List.70@70&10%
C. E. Jennings & Co.. Blacksmith...60&10%
C. E. Jennings & Co., Hand.....33⅓%

Blacksmiths—

Inch..	*2*	*3*	*4*	*5*	*6*	*8*	*10*
Each	*$3.70*	*3.95*	*4.55*	*5.10*	*5.70*	*6.55*	
Extra Length:							
Each	*$4.25*	*4.85*	*5.40*	*5.95*	*6.80*	*7.95*	

} Net Prices.

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*16*
Doz...	*$6.75*	*7.25*	*8.50*	*9.50*	*12.00*	*14.50*

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*	*12*
Doz....	*$3.75*	*4.25*	*4.50*	*5.00*	*5.75*	*6.75*

Bells—Cow—

Ordinary goods.....75@75&10%
High grade.....70@70&10%
Jersey.....75&10%
Texas Star.....50&10%

Door—

Abbe's Gong.....45%
Barton Gong.....55%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....20&10&10%

Hand—

Hand Bells, Polished.....60@50&10%
White Metal.....55@55&10%
Nickel Plated.....50@50&10%
Swiss.....60%
Silver Chime.....33⅓@33⅓&10%

Miscellaneous—

Farm Bells.....*lb. 2@2½c*
Steel Alloy Church and School.....
50&10&5@60%
Wilmot & Hobbs Mfg. Co., Gongs.....70%

Belting—Rubber—

Common Standard.....75@75&10%
Standard.....70@70&10%
Extra.....60&10&5%
High Grade.....60&10@50&10&5%
Boston Belting Co.:
Seamless Stitched, Imperial.....45%
Boston.....50&5%
Niagara.....60&5%

Leather—

Extra Heavy, Short Lap..50&10@60%
Regular Short Lap 60&10@60&10&5%
Standard.....60&10&10@70&5%
Light Standard.....70@70&10%

Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand.....60&10%
Durable Brand.....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....40@50%

Bicycle Goods—

John S. Leng's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—

Common Wooden.....70@70&10%
Cleveland Steel.....50&10@60&10%
Ford's Star Brand Self Lubricating.....60&10%
Hollow Steel, Ford's Pat. Star Brand.....50&10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50%
See also *Machines, Hoisting.*

Boards, Stove—

Zinc, Crystal, &c.....50&10%

Bolts—Carriage, Machine &c.—

Common, list Jan. 30, '95..70&10&2½@...%
Norway Iron, $3.00, list Oct. 7, '84..75@75&10%
Phila. Eagle, $3.00 list May 24, '99....80@80&10%
Bolt Ends, list Jan. 30, '95.....70&10&2½@...%
Machine, list Oct. 1, '99.70&10&2½@...%

NOTE—*The rapid advances in manufacturers' prices enable the jobbers to cut prices freely.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.53*	*.56*	*.58*	*.57*	*.80*

Cast Iron Spring Foot:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.85*	*1.20*	*1.50*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.80*	*.90*	*1.15*

Wrought Barrel Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.44*	*.50*	*.61*	*.70*	*1.25*

Wrought Barrel.....70@10@75&5%
Wrought " Bronzed.40&5@50&10%
Wrought Flush, B. K..50&10@60&10%
Wrought Shutter...40&10&10@60&5%
Wrought Square Neck.....50@50&10%
Wrought Sunk.....50@50&10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....60&10@...%
Stove.....67½%

Tire—

Common.....70@70&5%
American Screw Company:
Norway Phila., list Oct. 16, '84.....75%
Eagle Phila., list Oct. 16, '84.....77½%
Bay State, list Dec. 28, '99.....70%
Franklin Moore Co.:
Norway Phila, list Oct. 16, '84...75%
Eagle Phila., list Oct. 16, '84.....77½%
Eclipse, list Dec. 28, '99.....70%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99.....70%
Keystone Phila. list Oct. '84.....77½%
Norway Phila., list Oct. '84.....75%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$3.50*	*4.50*	*5.00*	*6.50*

Inch	*2¼*	*2½*
Per Doz.....	*$7.50*	*10.25*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25@30%

Boring Machines—See *Machines, Boring.*

Boxes Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., $30.....40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American...$1.15@1.25
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....60%
C. E. Jennings & Co.....60&10%
P., S. & W. Co., Peck's Patent 50&10@60%

Brackets—

Wrought Steel.....70@10@75&5%
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%
Griffin's Pressed Steel.....75&10%
Griffin's Folding Brackets.....70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co.....70@70&10%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—

Hoosier.....₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '98.25&10@55&5%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....50@50&10%
Fast Joint, Narrow.....50@50&10%
NOTE—*Jobbers often sell the following at 70&5%:*
Loose Joint.....70@70&5%
Loose Pin.....70@70&5%
Mayer's Hinges.....70@70&5%
Parliament Butts.....70@70&5%

Wrought Steel—

Loose Joint.....
Table and Back Flaps..
Narrow and Broad.....
Inside Blind.....
Loose Pin.....
Loose Pin, Ball and Steeple Tip

} 75@75&5%

Bronzed Wrt. Nar. and Inside Blind Butts.....50&10@50&10&5%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 3½@4c
Sharp, 1 prong.....per lb. 4¼@4½c
Perkins' Blunt.....₩ ℔ 5 ¢
Perkins' Sharp.....₩ ℔ 5½¢

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1.75	2.10	2.25	each.
Iowa Pattern....	....	2.40	2.60	each.
Buffalo Pattern.	....	2.30	2.50	each.
	30	30	40	qts.
New York Patt'rn	3.00	2.25	2.40	each.
Baltimore Patt'rn	2.50	2.85	3.10	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	108 gro.

Caps—Percussion—

Eley's E. B.	*50c*
G. D.	*per M 33@34c*
F. L.	*per M 57@60c*
G. E.	*per M 47@50c*
Musket.	*per M 57@60c*

Primers—

Berdan Primers, $1.00.....5%
B. L. Caps (*Sturtevant Shells*) $1.00.....5%
All other primers.....$1.10@$1.15

Carpet Stretchers—
See *Stretchers, Carpet.*

Cartridges—
B. B. Caps, Con., Ball Swgd.....$1.90
B. B. Caps, Round Ball...$1.12@1.18
Blank Cartridges:
22 C. F., $5.50.....10@5%
32 C. F., $7 00.....10@5%
22 cal. Rim, $1.50.....10@5%
32 cal. Rim, $2.75.....10@5%
Central Fire 25%
Pistol and Rifle.....15@5%
Primed Shells and Bullets.....15@5%
Rim Fire Sporting.....50%
Rim Fire, Military.....15@5%

Casters—
Bed.....70@70@10%
Plate.....75@75@5%
Philadelphia.....75@75@10%
Sose.....70&10%
Boss Anti-Friction.....70&10%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent, low list.....30%

Cattle Leaders—
See *Leaders, Cattle.*

Chain—
American Coil, Less than Casks:
5-16 ¼ 5-16 ⅜ 7-16 ½ 9-16
7.30 5.40 4.40 3.55 3.40 3.30 3.25
⅝ ¾ ⅞ to 1¼ inch.
3.25 3.20 3.20 cents per lb.
Cask lots deduct 25c per 100 lbs.
German Coil, list July 24, '97..60@10@10%
German Halter Chain, list July 24, '97.....60@10@10%
Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$26.00
6½—6-2, Straight, with ring..$27.00
6½—3-2, Straight, with ring..$31.00
6½—10-2, Straight, with ring..$35.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains, list April, '98.....50@10@60%
Jack Chain, list July 10, '93:
Iron.....60@60@10%
Brass.....60@60@10%
Safety Chain.....70@70@10%
Gal. Pump Chain.....lb 4½@4¾c
Covert Sad. Works:
Breast, Hitching and Bein Chains..50%
Covert Mfg. Co.:
Breast.....35&2%
Halter.....35&2%
Mesl.....35&2%
Rein.....35&2%
Stallion.....35&2%
Oneida Community:
Eureka Coil and Halter.....60@60&5%
Niagara Coil and Halters....60@60&5%
Niagara Cow Ties.....45&5@45&10&5%
Am. Coil and Halters....50&10&5@60%
Am. Cow Ties.....35&5@40&5%
Wire Goods Co.:
Dog Chain.....60%
Universal Dbl-Jointed Chain.....45%

Chalk—(From Jobbers.)
Carpenters', Blue.....gro. 45c
Carpenters', Red .....gro. 40c
Carpenters', White.....gro. 35c
See also *Crayons.*

Chalk Lines—See *Lines.*

Checks, Door—
Gardsley's.....40&10%
Columbia.....50&10%
Eclipse.....60@60&10%

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc., Chests, with Tools.....30%
Machinists' and Pipe Fitters' Chests, Empty.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....25@25&10%

Chisels—
Socket Framing and Firmer
Standard List.....70@10@..%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 76.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70&5%
L. & I. J. White.....30@30&5%
Tanged—
Tanged Firmers.....40@5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181....25%
L. & I. J. White, Tanged.....35&5%
Cold—
Cold Chisels, good quality.lb. 11@16c
Cold Chisels, fair quality.....lb. 12c
Cold Chisels, ordinary.....lb. 8@9c

Chucks—
Beach Pat., each $8.00.....20%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard...30%
Drill Chucks, New Model..... 2 %
Independent Lathe Chucks.....40%
Improved Planer Chucks.....20%
Universal Lathe Chucks.....40%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Car Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%

Clamps—
Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co. 40&10%
Carriage Makers' Sargent's.....50&10%
Beely, Parallel.....35%&10%
Eineman s, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners Walk—
Star Socket, All Steel....₩ doz. $4.00 net
Star Shank, All Steel....₩ doz. $3.75 net
W. & C. Snank, All steel 7¾ in. ₩ doz., $3.35; 8 in., $3.40; 8½ in., $3.50.

Cleavers, Butchers'—
Foster Bros.....30%
New Haven Edge Tool Co.'s.....40&10%
Fayette R. Plumb.38½&10@38½&10&5%
P., S & W.....33⅓&5@33⅓&10%
L. & I. J. White.....25%

Clippers—
Chicago Flexible Shaft Company
Handy Toilet.....₩ doz. $7.20
Mascotte Toilet.....₩ doz. $3.40
Monitor Toilet.....₩ doz. $9.00
Stewart's Patent.....₩ doz. $10.00

Clips, Axle—
Eagle and Superior ¼ and 5-16 inch.....70@10%
Norway, ¼ and 5-16 inch..70@70@10%

Cloth and Netting, Wire —See *Wire, &c.*

Cocks, Brass—
Hardware list (Globe, Kerosene, Racking, &c.).....70@70@10%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list.....40%
Embossed, Gilt, Pope & Stevens' list 30&10%
Leather Pope & Stevens' list.....40%

Compasses Dividers, &c.
Ordinary Goods.....70@10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
J. Stevens A. & T. Co.....25&10%

Conductor Pipe, Galvanized—
Factory Shipments to Jobbers:

Territory.	Carload. Loose.	L. C. L. Nested.
Eastern....	*75&10%*	*75&5%*
Central....	*75&7½%*	*75&2½%*
Southern..	*75&5%*	*75%*
S. Western.	*75%*	*70&10&2½%*

Terms, 2% for cash.
See also *Eave Trough and Elbows*

Coolers, Water—

Nos....	½	3	4	6
Labrador	$11.50	$14.00	$17.50	$20.00
8 gal.	$26.00			

Nos	8	4	6	8
Iceland..	$23.00	$25.00	$30.00	$37.50
10	14 gal.			
$57.00	$72.00			

Coopers' Tools—
See *Tools, Coopers'.*

Cord— Sash—
Braided, Drab.....lb. 25c
Braided, White, Common, lb17½@18c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India.....lb 9 @9¼c
Cotton Sash Cord, Twisted....12@16c
Patent Russia.....lb. 12½@13c
Cable Laid Russia.....lb. 13¼@14c
India Hemp, Braided.....lb 14@15c
India Hemp.....lb. 10@12c
Patent India.....lb. 10@12c
Pearl Braided, cotton.....₩ lb 17@18¢
Massachusetts, White.....₩ lb 23½¢
Massachusetts, Drab.....₩ lb 26½¢
Eddystone Braided Cotton.....₩ lb 19¢
Harmony Cable Laid Italian.....₩ lb 18¢
Ossawan Mills:
Crown, Solid Braided White...₩ lb 18¢
Braided, Giant, White.....₩ lb 17¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phoenix, White.....19¢
Samson:
Braided, Drab Cotton.....₩ lb 32½¢
Braided, Italian Hemp.....₩ lb 32½¢
Braided, Linen.....₩ lb 40¢
Braided, White Cotton, Spot.₩ lb 28½¢
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....10%

Wire, Picture—
Braided or Twisted,
See *Trade Report.*

Corn Knives and Cutters —See *Knives, Corn.*

Corn Planters—
See *Planters, Corn—*

Crackers, Nut—
Little Giant.....₩ gr. $24.00

Cradles—
Grain.....50%

Crayons—
White Round Crayons, gross.5½@6c
Cases, 100 gro., $5.00, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons.gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 20%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy.....₩ doz. $7.00
Fort Madison, Light.....₩ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden.....₩ doz. $10.00

Cutters— Glass—
Smith & Heminway Co.....30%

Meat—
Hale's..Nos. 11 & 111 12 & 112 13 & 113
Per doz.. $10.50 15 20 18.00
American.....30%

Nos.	0	1	2	3	4	5
Each	$5	$7	$10	$25	$50	$80

Connecticut:

No.	0	1	8	10	12
Each	$1.75	2.25	3.00	3.00	3.50

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$3.50	$4	$6

Dixon's, ₩ doz.....33⅓&10%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ₩ doz. $23.75.....50&10%
Little Giant, ₩ doz.....33⅓@33⅓&5%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

Sterling.....33⅓&5%

Nos.	1	2
Each	$1.00	$2.50

Miles' Challenge, ₩ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

New Triumph No. 605, ₩ doz. $24.00.....33⅓&5%
Woodruff's, ₩ doz.....40%

Nos.	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₩ doz. $60.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₩ gr....$18@$20
Slaw Cutters, 2 Knife, ₩ gr....$22@$36

Tobacco—
All Iron, Cheap.....doz. $4.25@$4.50
Enterprise.....25@30%
National, ₩ doz. $21.00.....40%
Sargent's, ₩ doz. $24.00.....45&10%

Washer—
Appleton's, ₩ doz. $16.00.....50&10&10%
Bonney's.....₩ doz. $4.75

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger..per doz. $10.00
Iwan's Improved Post Hole Auger....40%
Iwan's Perfection Post Hole Digger...₩ doz. $9.00
Kohler's Universal.....₩ doz, $14.00
Kohler's Little Giant.....₩ doz. $15.00
Kohler's Hercules.....₩ doz. $12.00
Kohler's Invincible.....₩ doz. $10 00
Kohler's Rival.....₩ doz. $9.00
Kohler's Pioneer.....₩ doz. $9.00
Never-Break Post Hole Diggers, ₩ doz. $24.00.....60%
Samson, ₩ doz. $34.00.....25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₩ doz. $18; No. 2, $15 No. 3, $14; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill..each $1.50@$1.75
Blacksmiths' Self-feeding.....each $3.75@$4.00
Breast, Millers Falls, each $3.00 .15&10%
Breast, P., S. & W.....30@30&10%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3.....16&5%
Johnson's Drill Points.....25&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....20@25%
Ratchet, Whitney's, P. S. & W....40&10%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓&5%

Twist Drills—
Standard List.....60@5@65@5%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Balsey's Screw Holder and Driver, ₩ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....27½%
Champion.....40&10%
Douglass Mfg. Co.....20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay & Parsons' Ratchet.....35%
Goodell's Automatic .....50&10&10@50&10&10&5%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....45&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60.....50&10&10%
Nos. 20 and 40.....60½&10%
Screw Driver Bits.....₩ doz. 50@70¢
Smith & Heminway Co.....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles.....60&10%
No. 86.....70&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....30&10&10%

Eave Trough, Galvanized
Factory Shipments to Jobbers.

Territory.	Carload.	L. C. L.
Eastern.....	*80¢10¢5%*	*80¢10%*
Central.....	*80&10¢2½%*	*80¢7½%*
Southern.....	*80¢10%*	*80¢5%*
S. Western....	*80¢2½%*	*80%*

Terms, 2% for cash.
See also *Conductor Pipe.*

Egg Beaters—See *Beaters, Egg*

Egg Openers—
See *Openers, Egg.*

Elbows and Shoes—
Factory shipments to jobbers.....60¢10¢5%

Emery, Turkish—

	4 to 16	5½ to 150	Flour
Kegs.....lb.	*4½c*	*5 c*	*3 c*
¼ Kegs ....lb.	*4¼c*	*5¼c*	*3 c*
¼ Kegs ....lb. 5 c		*5½c*	*8½c*
10-lb cans, 10 in case..... 6 c		*6½c*	*½c*
10-lb. cans, less than 10 ....10 c		*10 c*	*8 c*

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice —See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's.....50&10%

Faucets—
Cork Lined.....70¢5@70¢10¢5%
Metallic Key, Leather Lined..... 70@70¢10%
Red Cedar.....50@50¢5%
B. & L. B. Co.:
West's Lock, Open and Shut Key 50&10%
John Sommer's Peerless Tin Key.... 40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Common Cork Lined.70%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's Perfection Cedar....40%
Star.....60@60&5%
Star, Metal Plug new list.....40@40&5%
Lockport, Metal Plug, reduced list.60&5%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ¾ and ⅞ inch.....35%
Self Measuring:
Enterprise, ₩ doz. $36.00 .....40%
Lane's, ₩ doz. $36.00 .....40&10%
National Measuring, ₩ doz. $36.00...40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands.....70@75&5%
Good Brands.....75&10@75&10¢10%
Fair Brands.....80@80¢10%
Second Quality.....80¢10@80¢25%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....35%

Fixtures, Grindstone—
Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.90*	*3 10*	*3.30*	*3.80*	*4.60*

Stowell's Giant Grindstone Hanger.....₩ doz. $6.00
Stowell's Grindstone Fixtures.....50%
P., S. & W. Co.....50&10&10%
Reading Hardware Co.....30&20&10%
Sargent's.....60&10&10%

Fluting Machines—
See *Machines, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Sept. 1, 1900, list.
Grain or Barley Forks, 18 to 20 inches.....70¢5%
Hay, 2 tine.....65%
Hay, 3 tine.....66⅔%
Hay, 4 tine, Header and Barley Forks, 13 to 16 inches.....66⅔%
Manure, 4 tine 70%
Manure, 5 and 6 tine.....70%
Spading.....70¢5%
Iowa Dig-Ezy Potato.....65%
Victor, Hay.....66⅔%
Victor, Manure.....70%
Victor, Header.....60&30%
Champion, Hay.....66⅔%
Champion, Manure.....70%
Columbia, Hay.....66⅔&5%
Columbia, Manure 70%
Columbia, Spading 70%
Hawkeye Wood Barley 4 tine ₩ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger.....65%
Acme Hay.....60&20&7½%
Acme Manure.....60&20%
Dakota Header.....70&10&2½%
Jackson Steel Barley.....70&10&2½%
Kansas Header.....65&20%
W. & C. Favorite Wood Barley 4 tine, ₩ doz., $5.00; 5 tine, $6.00
Plated.—See *Spoons.*

Frames—
Saw—
Red, Polished and Varnished..doz. $1.15@$1.50
White.....doz. 75@80¢

Screens and Frames—
See *Screens.*

Freezers, Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best.	*$1.45*	*1.65*	*1.95*	*2.40*	*3.20*	*4.20*
Good	*$1 25*	*1.40*	*1.70*	*2.15*	*2.75*	*3.75*
Fair.	*$1.00*	*1.10*	*1 30*	*1.75*	*2.30*	*2.90*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—
Per 1000 Feet.
Hemp Fuse.....$2.60 } 10&5%
Cotton Fuse.....2.90
Single Taped Fuse.....3.25
Double Taped Fuse.....4.20
Triple Taped Fuse.....5.00

Gates, Molasses and Oil—
Stebbins'.....30&10@30&10&10%

Gauges—
Marking, Mortise, &c.....55&10@55&10¢10%
Barrett's Comb. Roller Gauge.....₩ doz. $6.75@7.25
Stanley R. & L. Co.'s Butt & Babbet Gauge.....30&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire P., S. & W. Co.....10&10&5%

Gimlets—

Nail, Metal, Assorted, gro. $1.40@1.75
Spike, Metal, Assorted gro. $3.00@3.50
Nail, Wood Handled, Assorted, gro. $4.00@4.25
Spike, Wood Handled, Assorted gro. $5.00@5.25

Glass, American Window

Jobbers' List, Sept. 1, 1900.
Small lots from store:
Single and Double Strength, all sizes ..... 85&5%
10% to be added on all first quality, both Single and Double.

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. 37½@50%
List B, Cans (½ pts., pts., qts.) ..... 33½@45%
List C, Cans (½ gal., gal.) .... 25@45%

Glue Pots—See *Pots, Glue.*

Grease, Axle—

Common Grade ..... *gro.* $5.00@6.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs.. ₩ doz. 1 lb $1.20; 2 lb $2.00
Snow Flake: 1 qt. cans, per doz. $2.00; 2 qt., $3.20; ½ gal. cans per doz. $6.00; 1 gal. $16.00; 5 gal. $24.00 } 10%

Grindstone Fixtures—

See *Fixtures, Grindstone.*

Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₩ 1000 ..... $9.00
Copper ₩ 1000 ..... $18.00

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—

	gro.
Peg Patent, Leather Top	$4.90@5.25
Peg Patent, Plain Top	$3.50@3.75
Sewing, Brass Ferrule	$1.50@1.60
Saddlers', Brass Ferrule	$1.35@1.45
Peg, Common	$1.25@1.35
Brad, Common	$1.50@1.75

Halters and Ties—

Covert Mfg. Co., Web ..... 45&2%
Covert Mfg. Co., Jute Rope ..... 45&2%
Covert Mfg. Co., Sisal Rope ..... 30&2%
Covert's Saddlery Works', 98 list, Web ..... 60&10%
Covert's Saddlery Works, Leather 60&10%
Covert's Saddlery Works, Jute ..... 60&5%
Covert's Saddlery Works, Sisal 60%
Covert's Saddlery Works, Manila ..... 60&5%
Covert's Saddlery Works, Cotton 70%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 50@50&5%
Heller's Farriers ..... 50@50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.35, $1.50, $1.75 ..... 40&10%
Peck, Stow & Wilcox ..... 40@40&10%
Fayette R. Plumb:
Plumb, A. E. Nail ..... 40&10@50%
Engineers' and B. S. Hand ..... 60&10&7½%
Machinists' Hammers ..... 60&10&7½%
Riveting and Tinners' ..... 50@50&10%
Sargent's U. S. New List ..... 45&10%

Heavy Hammers and Sledges—

3 lb. and under ..... *lb.* 45c
3 to 5 lb ..... *lb.* 36c } 30¢@10@80
Over 5 lb ..... *lb.* 30c } &10¢10%
Wilkinson's Smiths' ..... 9½¢@10¢ lb.

Handcuffs and Leg Irons

See *Police Goods.*

Handles—

Agricultural Tool Handles—

Hoe Rake, Fork, &c. ..... 60@60&10%
Shovel, &c., Wood D Handle .. 50@50&5%

Cross-Cut Saw Handles—

Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ..... *gro* $2 60@$3 00
Brad Awl ..... *gro.* $1.25@$1.50
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.25@$2 35; *large,* $3.50@$3.60.
Hickory Tanged Firmer, gro. ass'd. $1.75@$2.20; *large,* $3 50@$3.70.
Apple Socket Firmer, gro. ass'd, $1.70@$1.85; *large,* $2 00@$2.25
Hickory Socket Firmer, gro ass'd. $1.60 @ $1.75; *large,* $1.75 @ $2.00
Hickory Socket Framing, gro. ass'd. $2.50@$2.75; *large,* $2.65@$2.85
File, assorted ..... *gro.* $1.00@$1.15
Hammer, Hatchet, Axe, &c 60%
Hand Saw, Varnished, doz. 70@75c
Not Varnished ..... 50@60c
Plane Handles:
Jack, doz. 20@25c; *Jack Bolted* .. 55@60c
Fore, doz. 35@35c; *Fore, Bolted* .. 70@75c

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Doz	$0.85	1.30	1.60	1.95	2.45

Barn Door, New England Pattern, Check Back, Round Groove, Regular:

Inch	3	4	5	6
Doz	$1.45	1.90	2.55	3.10

Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 40%
Railroad 55%
Cronk Hanger Co.:
Loose Axle 60%
Roller Bearing ..... 60&10%
Lane Bros.:
Parlor, Ball Bearing $4.00
Parlor, Standard $3.25
Parlor, New Model $2.75
Parlor New Champion $2.40
Barn Door, Standard ..... 60&10%
Covered ..... 50&10&5%
Special ..... 60&10%
Lawrence Bros.:
Advance 60%
Cleveland ..... 60&10%
Crown 60%
New York 60%
Peerless ..... 60&10%
Sterling 60%
McKinney Mfg. Co.:
No. 2, Standard, $18 ..... 60&10%
No. 1, Special, $13 ..... 60&10%
Stowell Mfg. and Foundry Co.:
Atlas 60%
Baggage Car Door 50%
Climax Anti-Friction 50%
Elevator 40%
Interstate ..... 50&10%
Magic 50%
Matchless 60%
Nansen ..... 60&10%
Parlor Door 50%
Railroad ..... 50&10%
Street Car Door ..... 50&10%
Steel, Nos. 300, 400, 500 ..... 40&15%
Zenith for Wood Track ..... 50&10%
Taylor & Boggis Foundry Co.:
Kidder's ..... 50@50&10%
Van Wagoner & Williams Hdw Co.:
American Trackless ..... 33⅓&10%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 40%
Ives, Wood Track ..... 60&10%
L. T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing 40%
Wilcox Auditorium Ball Bearing 20%
Wilcox Barn Trolley No. 123 ..... 40%
Wilcox Fire Trolley, Roller Bearing 30%
Wilcox La Roy Noiseless Ball Bearing 40%
Wilcox New Century ..... 50&10&10%
Wilcox Trolley Ball Bearing 40%

Extra 5@10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—

McKinney's Perfect Hasp ₩ doz 40&10%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—

Best Brands ..... 10@10@50%
Cheaper Brands .... 50@10@50@10@5%
Note.—Net prices often made.

Hay and Straw Knives—See *Knives.*

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (*Victor; National; 1888 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.*)

No	1	2	3
Doz. pair	$0.75	1.45	2.50

Mortise Shutter: (*L. & P., O. S., Dixie, &c.*)

No	1	1½	2	2½
Doz. pair	$0.60	.55	.53	.45

Mortise Reversible Shutter, (Buffalo, &c.)

No	1	1½	2
Doz. pair	$0.65	.60	.55

Parker ..... 70@75%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Reading's Gravity ..... 75&10%
Sargent's, Nos. 1, 2, 5 ..... 60%&10%
Sargent's, Nos. 11 & 13 ..... 70&10%
Wrightsville H'dware Co.:
O. S. Lull & Porter ..... 80&2½%
Acme, Lull & Porter ..... 75&10%
Queen City Reversible ..... 75&10%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10&5%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%
1888 Old Pat'n, Nos. 1, 3 & 5 ..... 75&7½%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75&7½%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%
Shepard's Double Locking, Nos. 20 & 25 ..... 70&10%
Champion Gravity Locking, No. 75 ..... 75&7½%
Steamboat Gravity Locking, No. 10 ..... 5&7½%
Pioneer, Nos. 000, 45 & 5½ ..... 75&7½%
Empire, Nos. 101 & 103 ..... 70&7½%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%
Stanley's Steel Gravity Blind Hinges, ₩ doz. sets $1.30 ..... 30&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No	1	2	3
Hinges with Latches	$1.30	2.50	3.25
Hinges only	1.30	1.90	2.90
Latches only	0.55	0.65	0.95

New England:
With Latch ..... *doz* .... @$1.55
Without Latch .... *doz.* .... @$1.25
Reversible Self-Closing:
With Latch ..... *doz.* .... @$1.80
Without Latch ..... *doz.* .... @$1.45
Western:
With Latch ..... *doz.* $1.10@1.75
Without Latch ..... *doz.* $0.95@1.90
Wrightsville H'dware Co.:
Shepard's or Clark's, Nos. 1 & 2..65&2½%
Shepard's or Clark's, No. 3 ..... 55&5%

Spring Hinges—

Holdback, Cast Iron, gro. $3.00@3.25
Non-Holdback, Cast Iron ..... *gro.* $6.75@7.25
J. Bardsley 40%
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer's 33⅓%
Chicago Spring Butt Co.:
Chicago 20%
Floor Hinge 40%
Garden City Engine House 20%
Keene's Saloon Door 20%
Triple End 40%
Lawson Mfg. Co.:
Matchless 30%
Matchless Pivot 35%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₩ gr. $12.50
Ideal, No. 4 ..... ₩ gr. $9.00
New Idea No. 1 ..... ₩ gr. $9.00
New Idea, Double Acting 45%
Van Wagoner & Williams Hdw. Co.:
Acme, Wrt. Steel 30%
Acme, Brass 20%
American 30%
Columbia, No. 14 ..... ₩ gr. $9.00
Columbia, No. 18 ..... ₩ gr. $25.00
Columbia, Adjustable 30%
Gem, new list 25%
Clover Leaf ..... ₩ gr. $12.50
Oxford new list 25%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1898:
Light Strap Hinges .. 66⅔%
Heavy Strap Hinges .. 70%
Light T Hinges ..... 50&10%
Heavy T Hinges ..... 60&10%
Extra Heavy T Hinges ..... 66⅔% } Extra 25&10@25&10¢ 5%
Hinge Hasps 45
Cor. Heavy Strap 70%
Cor. Ex. Heavy T 66⅔
Screw Hook and Strap. { *6 to 12 in* .. *lb* 2¾@3 c; *14 to 20 in* .. *lb.* 2½@2¾c; *22 to 36 in* .. *lb.* 2¼@2½c
Screw Hook and Eye:
¾ to 1 inch ..... *lb.* 5¾@6 c
⅝-inch ..... *lb.* 6¼@7 c
½-inch ..... *lb.* 8¾@9 c

Hods, Coal—

	15	16	17	18 inch.
Galv. Open	$2 05	2.20	2.45	2.65 ₩ doz.
Jap. Open	$1.55	1.70	1.85	2.05 ₩ doz.
Galv. Fun'el	$2.75	2.90	3.10	3 45 ₩ doz.
Jap. Funnel	$2.00	2 15	2.35	2.70 ₩ doz.

Hoes—Eye—

Scovil and Oval Pattern ..... 60¢&5@60¢10¢&5%
Grub, list Feb. 23, 1899 .. 70¢&5@70¢10%
D. & H. Scovil 35%

Handled—

Sept. 1, 1900, List:
Field and Garden ..... 75¢&2½%
Ladies', Boys', Toy and Onion ..... 70¢10¢10%
Street and Mortar ..... 75¢7½¢2½%
Cotton ..... 70¢10¢10¢5¢2½%
Planters' ..... 70¢&30%
Weeding 75%
Note.—Manufacturers and Jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Crucible Garden Hoe ..... 75&2½%
Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10&2½%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₩ doz. $4.50
Junior Size ..... ₩ doz. $4.00
Ft. Madison Sprouting Hoe, ₩ doz. $4.80
Ft. Madison Dixie Tobacco Hoe.. 75&20%
Kretsinger's Cut Easy, per doz .... 75&2½
Warren Hoe 60%
W. & C. Ivanhoe ..... 75&2½
B. B. Cultivator Hoe ..... 75&10%
Acme Weeding ..... 75&10%
W. & C. Lightning Shuffle Hoe, ₩ doz. $5.50

Hog Rings and Ringers—See *Rings and Ringers.*

Hoisting Apparatus—See *Machines, Hoisting.*

Hollow Ware—See *Ware, Hollow.*

Holders—

Bit—

Angular, ₩ doz. $24.00 ..... 45&10%

File and Tool—

C. E. Jennings & Co. Model Tool Holders 33⅓%
Nicholson File Holders and File Handles 33⅓%

Hooks—

Cast Iron—

Bird Cage, Reading ..... } .50&10@60%
Bird Cage, Sargent's List .. }
Clothes Line, Sargent's List 50&10@5&10%
Celling, Sargent's List ..... 40&10%
Clothes Line, Stowell's 70%
Clothes Line, Reading List ..... 65&10@65&10&10%
Coat and Hat, Stowell's 70%
Coat and Hat, Reading ..... 70@75%
Coat and Hat, Sargent's List ..... 45&10%
Coat and Hat, Wrightsville ..... 65&10%
Harness, Reading List ..... 70&10@75%

Wire—

Belt 80%
Atlas, Coat and Hat:
Single Cases 45%
10 Case Lots ..... 45&10%
Czar Harness ..... 50&10&5%
Wire Coat and Hat:
Acme ..... 50&10&5%
B. B. ..... 50&10&5%
V Brace, Chief and Czar ..... 50&10&5%
Gem 60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.50; *8 in.,* $1.75; *10 in.,* $2.00.
Cotton ..... *doz.* $1.05@1.35
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; *Medium,* $6.00; *Heavy,* $8.50
Grass ..... *Nos.* 1 2 3 4
Best $1.50 1.75 2.00
Common ... $1.40 1.50 1.50 1.75
Potato and Manure 70%
Whiffletree ..... *lb.* 4½c
Hooks and Eyes:
Brass ..... 60¢10¢10@70%
Malleable Iron ..... 70¢&5@70¢10%
Covert Saddlery Works' Self Locking Gate and Door Hook ..... 60&10%
Crown Picture ..... 50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:
Competition ..... *ft.* 4½@ 4½c
3-ply Standard ..... *ft.* 5 @ 5 c
4-ply Standard ..... *ft.* 8 @ 9 c
3-ply extra ..... *ft.* 9 @10 c
4-ply extra ..... *ft.* 11 @12 c
Cotton Garden, ¾-in., coupled:
Low Grade ..... *ft.* 6 @7 c
Fair quality ..... *ft.* 8 @9 c

Irons—Sad—

From 4 to 10 ..... *lb* 3@3½c
B. B. Sad Irons ..... *lb.* 3½@4c
Chinese Laundry ..... *lb.* 5@5½c
Chinese Sad ..... *lb.* 3½@3½c
Mrs. Potts', per set:

Nos.	50	55	60	65
	67@72c	64@69c	77@82c	74@79c

New England Pressing, lb .. 3½@3½c

Soldering—

Soldering Coppers, 1 & 1½ lb., $1 @ 23c.; ₩ lb., 19 @ 21c
Covert Mfg. Co ..... 30&2%

Pinking—

Pinking Irons ..... *doz.* 50@60c

Jack Screws—See *Screws.*

Jacks, Wagon—

Covert Mfg. Co., Steel ..... 45&2%
Daisy 70%
Lockport ..... 40@40&10%
Victor 60%
Lane's Steel ..... 33⅓&5%

Kettles—

Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knife Sharpeners—See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.—

Dick's Butcher Knives 40%
Foster Bros.' Butcher, &c 30%
Hay and Straw—See *Hay Knives.*

Corn—

Ft. Madison Cut-Easy, ₩ doz $3.35
Withington Acme, ₩ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... 70&5@70¢10%
Adjustable Handle ..... 35@35&5
Bradley's 35%
C. E. Jennings & Co. Nos. 45, 46 .. 40&10%
Jennings & Grimm ..... 60%&5%
Swan's ..... 70&10&5%
Watrous ..... 30&10@40%
L. & I. J. White ..... 20&5@25%
Cantelo's Folding ..... 50@50&5%

Hay and Straw—

Lightning Pattern ..... per doz. $6.00 @6.75
Iwan's Sickle Edge ..... ₩ doz. $11.50
Lightning $7.50
Maine ..... ₩ doz. $8.50

Mining—

Buffalo ..... ₩ gro. $15.00

Miscellaneous—

Farriers' ..... doz. $2.00@3.00
Westenholm's ..... ₩ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip, gro ..... $1.35@1.40
Carriage, Jap, all sizes .. *gro.* 50@55c
Door, Mineral ..... *doz.* 60@65c
Door, Por. Jap'd ..... *doz.* 70@75c
Door, Por. Nickel .... *doz.* $2.00@2.10
Bardsley's Wood Door, Shutter, &c .. 15%
Picture, Sargent's ..... 60&10%
Snow's Victor ..... 50&10%

Ladders, Step—

Handy Ladder Works:

Length.	Extended Ready for Use.	Shipped Ready for Use.	Shipped K. D.
Feet.	Feet.	Per doz.	Per doz.
4	7	$16.00	$14.00
5	9	19.50	17.00
6	11	24.50	21.00
7	13	29.50	25.00
8	15	34.00	29.00
9	17	39.00	32.00
10	19	43.00	35.00
11	21	46.50	40.00
12	23	51.00	45.00

Ladies' Melting

L. & G. Mfg. Co. 60%
P., S. & W. ..... 40@40&10%
Reading ..... 50&10%
Sargent's ..... 40@40&10%

Lanterns' Tubular

Regular Tubular ..... *doz. $4.50@5.00*
Side Lift Tubular ..... *doz. $4.75@5.25*
Square Lift Tubular ..... *doz. $4.75@5.25*
Other Styles ..... *40@10@40@10@5%*

Bull's Eye Police

No. 1, 2¾ inch *$3.60*
No. 2, 3 inch *$4.00*

Latches, Thumb

Roggin's Latches ..... *doz. 32@33c*

Lawn Mowers

See *Mowers, Lawn.*

Leaders, Cattle

Small ..... *doz. 50c; large, 55c*
Covert Mfg. Co. ..... 45&2%

Lemon Squeezers

See *Squeezers, Lemon.*

Lifters, Transom

Dickson:
3 x 4 ft. x ¼ ..... ₩ 100 $11.00
Other sizes, Iron ..... 70&10%
Other sizes, Brass and Bronze 70%
R & E 45%

Lines

Wire Clothes, Nos...	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.65*
75 feet	*$1.80*	*1.70*	*1.30*

Ocsawan Mills.
Crown Solid Braided Chalk 33⅓%
Mason's, No. 0 to No 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 8 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gr. 30%

Locks

Cabinet

Cabinet Locks ..... *35½@35½&7½%*

Door Locks, Latches, &c.

[Net prices are very often made on these goods.]

Reading Hardware Co. 40%
R. & E. Mfg. Co. 50%
Sargent & Co. ..... 40@40&10%
Snow's Victor ..... 50&10%

Elevator

Stowell's 33⅓%

Padlocks

Wrought Iron ..... *75&10@30%*
R. & E. Mfg. Co. Wrt. Steel and Brass. 50%

Sash, &c.

Fitch's Bronze and Brass 66⅔%
Fitch's Iron 70%
Ives' Patent ..... 55&5@65%
Reading ..... 60&10&10@70%

Machines

Boring

Without Augers.

	Upright.		Angular.
Improved No. 3	$4.25	No. 1	$5.00
Improved No. 4	3.75	No. 2	3.38
Improved No. 5	2.75		
Jennings'	2.50		3.00
Millers' Falls			5.75
Snell's, Rice's Pat.	2.50		2.75
Swan's, No. 500	5.10	No. 200	6.45

Hoisting

Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%

Ice Cutting

Chandler's 15%

Washing

Wayne American, ₩ doz. $28.00
Western Star, No. 2, ₩ doz. 28.00
Western Star, No. 3, ₩ doz. 30.00
St. Louis, No. 41, ₩ doz. 60.00
Carload lots 10% off, freight allowed.

Mallets

Hickory ..... *45&5@50&5%*
Lignumvitæ ..... *45&5@50&5%*
Tinners', Hickory and Applewood, doz. ..... *50@55c*

Mats

Door

Elastic Steel (W. G. Co.) 10%

Mattocks

See *Picks and Mattocks.*

Meat Cutters

See *Cutters, Meat.*

Milk Cans

See *Cans, Milk*

Mills—Coffee

Enterprise Mfg. Co. ..... 25@30%
National, list Jan. 1, '04 ..... 30%
Parker's Columbia and Victor ..... 50&10@60%
Parker's Box and Side ..... 50&10@60%
Swift, Lane Bros. 30%

Mincing Knives

See *Knives, Mincing.*

Molasses Gates

See *Gates, Molasses.*

Money Drawers

See *Drawers, Money.*

Mowers, Lawn

Net prices are generally quoted.
Cheap ..... *all sizes, $2.00@2.10*
Good ..... *all sizes, $2.50@2.75*

	10	12	14	16-inch
High Grade	*4.25*	*4.50*	*4.75*	*5.00*
Pennsylvania and Continental	60&10&5%			
Quaker City	70&5%			
Great American	70&5%			

Philadelphia:
Styles M., S., C., K., T. ..... 70&5%
Style A, all Steel ..... 60&10%
Style E, Low Wheel ..... 60&10%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, low list ... 50&5%

Nails

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899 ..... *85@85&10%*
Hungarian, Finishing, Upholsterers', &c. See Tacks

Horse

Nos.	6	7	8	9	10	
A. C.	25¢	23¢	22¢	21¢	21¢	40&5%
Ausable	28¢	26¢	25¢	24¢	23¢	50&10%
Capewell	19¢	18¢	17¢	16¢	16¢	10&5%
C. B. K.	25¢	25¢	22¢	21¢	21¢	40%
Champ'n	28¢	26¢	25¢	24¢	23¢	40&5&2%
Clinton	19¢	17¢	16¢	15¢	14¢	30&10&5%
Maud S.	25¢	23¢	22¢	21¢	21¢	50%
Neponset	23¢	21¢	20¢	19¢	18¢	40%
Putnam	23¢	21¢	20¢	19¢	18¢	33⅓%
Vulcan	23¢	21¢	20¢	19¢	18¢	25&10%
American, Nos. 5 to 10 ₩ lb.						9@9½¢

Picture

	1½	2	2½	3	3½ in.
Brass Head	*.45*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head	*1.10*	*1.10*	*1.10*		*gro.*

Nippers

See *Pliers and Nippers.*

Nut Crackers

See *Crackers, Nut.*

Nuts

List Feb. 1, '99.
Cold Punched ..... *Off*
Mfrs. or U. S. Standard. ..... *list.*
Hexagon, plain ..... *5.80@5.90c*
Square, plain ..... *5.40@5.50c*
Square, C. T. & R. ..... *5.60@5.70c*
Hexagon, C. T. & R. ..... *6.40@6.50c*
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank or Tapped ..... *5.80@5.90c*
Hexagon Blank or Tap'd ..... *6.50@6.60c*

Oakum

Best or Government ..... *lb. 6¼c*
Navy ..... *lb. 5 c*
U. S. Navy ..... *lb. 5¾c*
Plumbers' Spun Navy *5¾c*
In carload lots ¼c lb. off f.o.b. New York.

Oil, Axle

Snow Flake: (33⅓&10%)
1 pt. cans, per doz. $3.00
1 qt. cans, per doz. $4.80
1 gal. cans, per doz. $15.00
5 gal. cans, per doz. $66.00

Oil Tanks

See *Tanks, Oil.*

Oilers

Brass and Copper ..... *40&10@50%*
Tin or Steel ..... *60&10@65%*
Zinc ..... *60&10@65%*
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Wilmot & Hobbs Mfg. Co:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc. ..... 60@60&10%

Oponers

Can

French ..... *doz. 35c*
Iron Handle ..... *doz. 25@27c*
Sprague, Iron Hdle., per doz. ..... *35@40c*
Sardine Scissors ..... *doz. $1.75@$3.00*
Tip Top ..... per doz. $0.75
National, ₩ gro. ..... $1.75@$2.00
Stowell's ..... per doz. 40@45c
Waldorf, ₩ gro. $9.00

Egg

Nickel Plate ..... per doz., $2.00
Silver Plate ..... per doz., $4.00

Packing

Rubber

Standard, fair quality ..... *70&10@75%*
Inferior quality ..... *75&10@80%*
Extra ..... *60&5@60&10&5%*
Jenkins' Standard, ₩ lb 80c ..... 25@25&5%

Miscellaneous

American Packing ..... *9@10c lb.*
Cotton Packing ..... *13@15c lb.*
Italian Packing ..... *10½@11½c lb.*
Jute ..... *5½@5c lb.*
Russia Packing ..... *12@13c lb.*

Pails

Creamery

S. S. & Co., with gauges ... No 1 $6.50; No. 2, $6.75 ₩ doz.

Galvanized

Price per gro.

Inch	*10*	*12*	*14*
Water, Regular	*18.00*	*$1.00*	*$4.00*
Water, Heavy	*22.00*	*25.00*	*28.00*
Fire, Rd. Bottom	*31.00*	*33.00*	*35.00*
Well	*27.00*	*29.00*	*31.00*

Pans

Dripping

Standard List ..... *65&10@65%*

Fry

Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.60*	*.75*	*.85*	*.95*	*1.15*

Roasting and Baking

Regal, S. S. & Co., ₩ doz., Nos. 5, $4.50; 10 $5.00; 20, $5.50; 30, $6.00.
Simplex, ₩ gro., No. 40 $30.00; 50, $34.50; 60 $39.00; 140, $33.00; 150, $37.50; 160, $43.00.

Paper

Building Paper

	Per roll
Rosin Sized Sheathing:	*500 sq. ft.*
Light wt., 20 sq. ft. to lb.	*$0.40@0.45*
Medium wt., 18 sq. ft. to lb.	*$0.60@0.65*
Heavy wt., extra quality	*$0.95@1.05*
Medium Grades Water Proof Sheathing	*$0.80@1.25*
Deafening Felt, 2, 6 and 4½ sq. ft. to lb., ton	*$40.00*
York Haven Waterproof Sheathing	$1.35@1.75

Tarred Paper.

1 ply (roll 400 sq. ft.), ton *$28.00*
2 ply, roll 100 sq. ft. ..... *50@55c*
3 ply, roll 100 sq. ft. ..... *75@80c*

Sand and Emery

List Dec. 23, 1899 ..... *50&10@50&10&10%*

Parers

Apple

Advance	₩ doz.	$4.50
Baldwin	₩ doz.	$5.00
Bonanza	each	$5.00
Dandy	each	$7.50
Eureka, 1898	each	$16.00
Family Bay State	₩ doz.	$12.00
Hudson's Little Star	₩ doz.	$4.00
Hudson's Rocking Table	₩ doz	$5.50
Improved Bay State	₩ doz.	$27.00@30.00
New Lightning	₩ doz.	$5.50
Reading 72	₩ doz.	$4.00
Reading 78	₩ doz.	$7.00
Turn Table '98	₩ doz.	$5.50
White Mountain	₩ doz.	$4.00

Potato

Saratoga	₩ doz.	$5.50
White Mountain	₩ doz.	$4.50

Paris Green

per lb.

In Arsenic, kegs or casks *13¼c*
In kegs, 100 to 175 lbs. ..... *13 c*
In kits, 14, 23, 56 lbs. ..... *14 c*
In paper boxes, 2 to 5 lbs. ..... *14 c*
In paper boxes, 1 lb. *14½c*
In paper boxes, ½ lb. *15½c*
In paper boxes, ¼ lb. *16½c*

Picks and Mattocks

List Feb. 25, 1899 ..... *75@75&10%*

Pinking Irons

See *Irons, Pinking.*

Pins

Escutcheon

Brass ..... *60&10%*
Iron, list Nov. 11, '85 ..... *60&10%*

Pipe, Cast Iron Soil

Factory Shipments.

Standard, 2-6 in. ..... *70@70&5%*
Extra Heavy, 2-6 in. ..... *75@75&5%*
Fittings ..... *75&10&5@80%*

NOTE.—*Freight allowances on Carload lots.*

Pipe, Merchant, Boiler Tubes, &c.

Carloads to Consumers.
Merchant Pipe.

	Black.	*Galvanized.*
⅛ to ½ inch	*61%*	*48%*
¾ to 10 inch	*68½%*	*56%*

Boiler Tubes.

Steel.	*Up to 22 feet*	*22 feet and over.*
1 to 1½ inch and 2½ in.	*49½%*	*44½%*
1¾ to 2¼ inch	*45%*	*39½%*
2¾ to 13 inch	*57%*	*51½%*
Iron.		
1 to 1½ inch and 2½ in.	*49½%*	*44½%*
1¾ to 2¼ inch	*45%*	*39½%*
2¾ to 13 inch	*57%*	*51½%*

Casing, Cut Lengths. ..... *S. & S.*
2 to 3 inch *58%*
3½ to 4 inch *63%*
4½ to 12½ inch *65%*

NOTE.—*The old list is still used by some jobbers, and net prices are often quoted.*

Planes and Plane Irons—Wood Planes

Molding ..... *40@42½@40@5%*
Bench, First quality ..... *45@10@45@10@5%*
Bench, Second quality ..... *50@10@50@10@5%*
Bailey's (Stanley R. & L. Co) ..... 50&10@50&10&10%
Gage Self Setting 35%

Iron Planes

Bailey's (Stanley R. & L. Co) ..... 50&10@50&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10@25&10&10%
Sargent's ..... 50&10&10%

Plane Irons

Wood Bench Plane Irons ..... *35@35&5%*
Buck Bros. 30%
Butcher's ..... $5.00@5.25 to ₩
Stanley R. & L. Co. ..... 50&10@50&10&10%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse ..... ₩ doz. $9.00

Plates

Felloe ..... *lb. 5½@5½c*
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00 ..... 50%

Pliers and Nippers

Button Pliers ..... *65&10@70&10%*
Gas Burner, per doz., 5 in. ..... *$1.15@$1.20; 6 in.* ..... *$1.35@$1.45.*

Gas Pipe	*7*	*8*	*10*	*12-in.*
	$1.75	*$2.00*	*$2.75*	*$3.75*
Acme Nippers				40@40&5%
Bernard's:				
Parallel Pliers, &c.				35%
Paragon Pliers				50&5%
Lodi Pliers				50&5%
Elm City Fence Pliers				35%
Cronk Hanger Co.:				
Cronk's				60%
Improved Button				70&5%
Stub's				50%
Combination and others				25%
Heller's Farriers' Nippers, Pincers, and Tools				50@50&5%
Morrill's Parallel, ₩ doz. $12.00				30&5%
P., S. & W. Cast Steel				30&10@40%
P., S. & W. Tinners' Cutting Nippers.				40@40&5%
Swedish Side, End and Diagonal Cutting Pliers				50%
Utica Drop Forge & Tool Co.:				
Pliers and Nippers, all kinds				40%

Plumbs and Levels

Plumbs and Levels ..... *70&10@75&5%*
Davis Iron, Machinist Nos. 1 to 14 ..... 20%
Davis Iron, Adjustable Nos. 6 to 49 ..... 35%
Disston's 70%
Pocket Levels ..... 73&10&10@75&10%
Stanley R. & L. Co.:
70&10@70&10&10%
Stanley's Duplex ..... 25&10@25&10&10%
Woods' Extension 33⅓%

Poachers, Egg

Buffalo Steam Egg Poachers, ₩ doz., No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50 ..... 50%

Points, Glaziers'

Bulk and 1 lb. papers ..... *lb. 9½@10 c*
½-lb. papers ..... *lb. 10 @10½c*
¼-lb. papers ..... *lb. 10½@11 c*

Pokes, Animal

Ft. Madison Hawkeye ..... ₩ doz. $3.25
Ft. Madison, Western ..... ₩ doz. $3.75

Police Goods

Manufacturers' Lists ..... *25@25&5%*
Tower's 25%

Polish—Metal

Prestoline Liquid, No. 1 (¼ pt.), ₩ doz. $3.00; No. 2 (1 qt.), $9.75 ..... 40%
Prestoline Paste ..... 33⅓@40%
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gr. $4.50; ½ ℔ boxes, ₩ doz. $1.25; 1 ℔ boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz. $1.25; ₩ gr. $12.00.
Barkeepers' Friend Metal Polish, ₩ doz. $1.75; ₩ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₩ doz. $1.50

Stove

Black Eagle Benzine Paste, 5 ℔ cans ₩ ℔ 10¢
Black Eagle, Liquid, ½ pt. cans ₩ doz. 75¢
Black Jack Paste, ¼ ℔ cans, ₩ gro. $9.00
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ ℔ 8¢
Fireside ..... ₩ gr. $2.50
Gem, ₩ gr. $4.50 ..... 10%
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, ½ pt. cans ₩ doz. $1.50
Wynn's Black Silk, 5 ℔ pail ..... each 70¢
Wynn's Black Silk, ½ ℔ box, ₩ doz. $1.00
Wynn's Black Silk, 5 oz. box, ₩ doz. $0.75
Wynn's Black Silk, ½ pt. liq., ₩ doz. $2.00

Poppers, Corn

Round or Square:
1 qt. ..... *gro. $7.00@$7.50*
1½ qt. ..... *gro. 9 50@ 10.00*
2 qt. ..... *gro. 10.50@ 11.00*

Post Hole and Tree Augers and Diggers

See also *Diggers, Post Hole, &c.*

Potato Parers

See *Parers, Potato.*

Pots

Glue

Enameled ..... *40&10@50%*
Tinned ..... *40@45%*

Powder

In Canisters:
Duck, 1 lb. each *45c*
Fine Sporting, 1 lb. each *75c*
Rifle, ½-lb. each *15c*
Rifle, 1-lb. each *25c*
In Kegs:
Duck, 6½-lb. kegs *$2.25*
Duck, 12½-lb. kegs *$4.25*
Duck, 25-lb kegs *$8.00*
Rifle, 6½-lb. kegs *$2.25*
Rifle, 12½-lb kegs *$4.25*
Rifle, 25-lb. kegs *$8.00*
King's Smokeless Shot Gun and Rifle: (20&2½&10%)
Keg (25 ℔ bulk) $22.00
Half Keg (12½ ℔ bulk) $11.25
Quarter Keg (6¼ ℔ bulk) $5.75
Canister (1 ℔ bulk) $1.00
King's Semi-Smokeless:
Keg (25 ℔ bulk) $16.00
Half Keg (12½ ℔ bulk) $8.25
Quarter Keg (6¼ ℔ bulk) $3.75
One Pound Can, bulk $0.50

Presses

Fruit and Jelly

Enterprise Mfg. Co. ..... 30@25%

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail

Crown, ₩ doz. $18.00 ..... 50%
Crown Prince, ₩ doz. $15.00 ..... 50%
Cyclops ..... 40@40&10%
Diamond B, No. 2, doz. $22.; No. 3, $11 ..... 40%
Eureka, 5 ℔, doz., $16.00; 3 ℔ $15 ..... 40%
Giant, No. 1, ₩ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%
Miller's Falls, No. 5, per doz. $12.00 ..... 15&10%
Pelican ₩ doz. $9.00 ..... 40&10%
Scranton, No. 1 and 2, ₩ doz. $9.00
Scranton, No. 3, ₩ doz. $8.50

Pulleys—

Hay Fork, Swivel or Solid Eye..... doz. $1.50@1.75
Hay Fork, Stowell's Anti-Friction, 5-in. Wheel, ₱ doz. $12.00..... 40%
Hot House, Awning, &c.....60@60&10%
Japanned Clothes Line.....60@60&10%
Japanned Screw.....70&10&10%
Japanned Side.....70&10&10%
Stowell's Ceiling or End, Anti-Friction 60%
Stowell's Dumb Waiter, Anti-Friction .. 60&10%
Stowell's Electric Light.....60%
Stowell's Side, Anti-Friction.....60&10%

Sash Pulleys—

Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2¼ in..... ₱ doz. 25¢
No. 9, 1¾ in..... ₱ doz. 20¢
Extra for Plated Finish..., ₱ doz. 20¢
Extra for Anti-Friction Bronze Bushing..... ₱ doz 10¢
Grand Rapids All Steel Noiseless.... 40%
Ideal No. 18.....1¾ in., ₱ doz., 20¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14¼¢; 2 in., 16¼¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—*See Blocks.*

Pumps—

Cistern.....60@60&10%
Pitcher Spout..... 75&5@75&10%
Pump Leathers, all sizes....gro. $5.00
Barnes Dbl. Acting (low list)..... 55%
Flint & Walling's Fast Mail...55@55&10%
Flint & Walling's Pitcher Spout.....75&3%
Loud's Suction Pumps, U. H. Co.....20%
Myer's Pumps, low list 50%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....30%

Punches—

Revolving (4 tubes)...doz. $3.75@4.25
Saddlers' or Drive, good..doz. 65@70c
Spring, good quality.....$1.65@1 75
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....50%
Bemis & Call Co.'s Spring.....50%
Niagara Hollow Punches.....45%
Niagara Solid Punches.....55%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co..... 35@35&5%
Tinners' Solid, P., S. & W.Co., ₱ doz. $1.44..... 55%

Rail—Barn Door, &c.—

Barn Door, Light..In. ¼ ⅝ ¾
100 feet.....$2.00 $2.50 $3.00
B. D., for N. E. Hangers:
Small. Med. Large.
100 feet.....$2 20 2.70 3.20
Sliding Door, Bronzed Wr't Iron, ft. 6¼c
Sliding Door, Iron Painted....2½@3c
Sliding Door, Wrought Brass, 1¼ in..... lb. 36c..30%
Cronk's Double Braced Steel Rail, ₱ foot..... 3½¢
Cronk's O. N. T. Rail..... 3½¢
Lanes' O. N. T., ₱ 100 ft., 1 Inch....$2.65
Lanes' Standard, ₱ 100 ft..... 3.75
Lawrence Bros.' ..... ₱ ft. 4½¢
McKinney's None Better..... ₱ ft. 3¢
McKinney's Standard..... ₱ ft. 3½¢
Moore's Wr't. Bracket, Steel..... 3½¢
Stowell's Steel Rail, Plain ..... 3½¢

Rakes—

Net Prices, Malleable Rakes:
10 12 14 16-tooth
Shank.....$1.50 1.60 1.75 1.85
Socket.....$1.65 1.80 1.95 2.10
Sept. 1, 1900, List:
Cast Steel..... 70¢&5&2%
Malleable..... 70¢10@75¢&5%
Lawn Rakes, Metal Head, per doz., 20 teeth. $3.25; 24 teeth $3 50.
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 29 and 30 teeth..... ₱ doz. $4.50
Kohler's Lawn Queen, 24-tooth, ₱ doz. $4.00
Kohler's Paragon, 24-tooth, ₱ doz. $3.00
Kohler's Steel Garden, 14-tooth, ₱ doz. $3.50
Kohler's Malleable Garden, 14-tooth, ₱ doz..... $2.50

Rasps, Horse—

Disston's..... 75%
Heller Bros..... 60&10&10%
McCaffrey File Co. Horse Rasps..... 60&10&5%
New Nicholson Horse Rasp.....70&10%
See also *Files.*

Razors—

Fox Razors, No. 42...₱ doz. $30.00
Fox Razors, No 44....₱ doz. $24.00
Fox Razors, No. 82, Platina, ₱ doz $24.00
} 40%
Sterling Razor Works..... 50%

Razor Strops—

See *Strops, Razor.*

Reels—Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes..... 25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor.50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2904N, 2904P and PN, 002904PN, 0924 and 0924N, 5009N and PN.....40&10%
Shakespeare, Style C..... 25%

Registers—

Black Jap.....50¢10@60%
White Jap..... 40%
Bronzed..... 40%
Nickel Plated..... 50%
Electro Plated..... 40%
} *Extra 10% often given.*

Riddles, Grain or Sand—

16 in. per doz.....$2.00@$2.25
17 in. per doz.....$2.25@$2.50
in. per doz.....$2.50@$2.75

Rings and Ringers—

Bull Rings—

	½	⅝	3 Inch.
Steel	$0 75	0.83	0.88 doz.
Copper	1.10	1.30	1.50 doz.

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.50@5 00
Hill's Ringers, G. I.....doz. 75c
Blair's Rings..... ₱ gr. $5.75@6.00
Blair's Ringers..... ₱ doz. $0.90@1.00
Brown's Rings..... ₱ gro. $6.00@6.25
Brown's Ringers..... ₱ doz. $1.00@1.10
Perfect Rings..... ₱ gro. $9.00@9.50
Perfect Ringers, ₱ doz..... $1.25@1.35
Rapid Rings..... ₱ gro. $6.00
Rapid Ringers..... ₱ doz. $3.50

Rivets and Burrs—

Copper.....50@50&5%
Iron or Steel:
Tinners' .....70¢10@75%
Miscellaneous ....70¢10@75%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list.....50&10&10%
Cronk's Stay ....60&5%
Cronk's Brinkerhoff..... 40&5
Lane's Stay ..... 33⅓&5
Stowell's Barn Door Stay...₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger. lb. 9¼@ 9¾c
Manila.....¾-inch. lb. 10 @10¼c
Manila..¼ and 5-16 in. lb. 10¼@10¾c
Manila, Tarred Rope, 15 thread.....lb 9¼@ 9¾c
Manila Hay Rope Med'm. lb 9¼@ 9¾c
Sisal, 7-16 in. and larger. lb. 6¾@ 7 c
Sisal.....¾-inch. lb. 7¼@ 7½c
Sisal.....¼ and 5-16 in. lb. 7¾@ 8 c
Sisal, Hay Rope, 2 to 10 ply..... lb. 7 @ 7½c
Sisal, Tarred, Medium Lath Yarn..... lb. 6½@ 6¾c
Cotton Rope:
Best, ¼-in. and larger..lb... @14 c
Med'm, ¼-in. and larger lb... @11½c
Com., ¼-in. and larger. lb... @ 9 c
Jute Rope, No. 1, ¼ in. and up ..... lb... @ 6½c
Jute Rope, No. 2, ¼ in. and up..... lb .. @ 6 c

Wire Rope—

Galvanized .....25¢10¢2%
Plain..... 30¢10¢2%

Ropes, Hammock—

Covert Mfg. Co.....45&2%
Covert Saddlery Works..... 60%

Rules—

Boxwood..75¢10¢10¢10¢10@75¢10 ¢10¢10¢10¢5%
Ivory ...40¢10¢10@40¢10¢10¢10¢10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber ..... 50&10%
Stanley R. & L. Co.:
Boxwood....75&10&10@75&10&10&10%
Ivory..... 35&10@35&10&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cords—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins' Circular..... ..... 50@50&10%
Atkins' Band .....50&10@60%
Atkins' Cross Cuts ..... 35&5%
Atkins' Mulay, Mill and Drag.....50&10%
Atkins' One-Man Saw..... 40%
Atkins' Wood Saws 40%
Atkins' Hand, Compass, &c..... ... 40%
Disston's Circular Solid and Inserted Tooth..... 50%
Disston Band 2 to 14 in. wide..... 60%
Disston Band ¼ to 1¾..... 70%
Disston Crosscuts..... 45@45&10%
Disston Narrow Crosscuts.....50@50&10%
Disston Mulay, Mill and Drag..... 50%
Disston Framed Woodsaws..35@35&7½%
Disston Woodsaw Blades....40@40&7½%
Disston Woodsaw Rods..... 20%
Disston Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination...30@30&7½%
Disston Compass Keyhole, &c.25@25&7½%
Disston Butcher Saws and Blades..... 35@35&7½%
C. E. Jennings & Co.'s.:
Back Saws..... 35%
Butcher Saws..... 35%
Compass and Key Hole Saws..... 25%
Framed Wood Saws..... 40%
Hand Saws..... 25@30%
Wood Saw Blades..... 45%
Peace Circular and Mill..... 50%
Peace Cross Cuts, list Jan. 1, '99..... 50%
Peace Hand, Panel and Rip..... 30%
Richardson's Circular and Mill..... 50%
Richardson's X Cuts, list Jan. 1, '99..50%
Richardson's Hand, &c..... 30%
Simonds' Circular Saws..... 50%
Simonds' Crescent Ground Cross Cut Saws..... 35%
Simonds' One-Man Cross Cuts....40&10%
Simonds' Gang Mill, Mulay and Drag Saws..... 45@45&5%

Hack Saws—

Disston Concave Blades..... 25%
Disston Keystone..... 30%
Disston Hack Saw Frames..... 50%
C. E. Jennings & Co's.:
Hack Saw Frames, Nos. 175, 180, 330..... 40%
Hack Saws, Nos. 175, 180, 330, complete..... 40%
Griffin's Hack Saw Frames 45%
Griffin's Hack Saw Blades..... 45%
Star Hack Saws and Blades..... 15&10%

Scroll—

Barnes' No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 30%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $4.00..... 15&10%

Scale Beams—

See *Beams, Scale.*

Scales—

Family, Turnbull's.... ...30@30&10%
Hatch, Counter:
Platform, 4 sb. by ½ oz... doz. $5.75
Two Platforms, 8 lb. by ½ oz.... doz. $16.00
Union Platform, Plain....$1.75@2.00
Union Platform, Striped..$1.85@2.15
Chatillon's Eureka..... 25%
Chatillon's Favorite..... 40%
Chatillon's Grocers' Trip Scales..... 50%
Peloubet Scales—Household, Counter, Confectionery, Postal, Ice, &c.....50%
"The Standard" Portables 45%
"The Standard" R. R. and Wagon....50%

Scrapers—

Box, 1 Handle .....doz $2.25@2.75
Box, 2 Handle..... doz. $3.75@4.00
Ship, No. 1, doz. $3.50; No 2, $2.25@2.50
Adjustable Box Scraper (S. R. & L. Co.) $3.00..... 30&10%

Screens, Window and Frames—

Bonanza Window Screens.....60@60&5%
Flyer Pattern Window Screen.60@60&5%
Maine Window Screen Frames.40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames..... 60&10&5%
Porter's Extension Window Screens.. 50&10%
Wabash Spring Adj. Screen. 50%

Screw Drivers—

See *Drivers, Screw.*

Screws—

Bench and Hand—

Bench, Iron..doz. 1 in., $3.00@3.25; 1¼, $3.50@3.75; 1¼, $4.00@4.50
Bench, Wood, Beech..doz. $3.50@3.75
Hand, Wood..... 50¢10@40%
Hand, R. Bliss Mfg Co..... 35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99..... 80@...%
Coach and Lag, Gimlet Point, list Oct. 1, '99.....75¢15@...%
Hand Rail, list Jan. 1, '81.60¢10@...%

Jack Screws—

Millers Falls..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P., S. & W..... 40&5@40&10%
Sargent..... 70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50&10%
Flat or Round Head, Brass..... 50@50&10%

Set and Cap—

Set (Iron or Steel) ..... 70¢10%
Sq. Hd. Cap..... 65¢10%
Hex. Hd. Cap..... 65&10%

Wood—

List Jan. 1, 1900.

Flat Head, Iron..... 85c
Round Head, Iron..... 80c
Flat Head, Brass..... 82½c
Round Head, Brass..... 77½c
Flat Head, Bronze..... 75c
Round Head, Bronze.... 72½c
Drive Screws.....
} *Extra 10&5 @...%*

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grass Scythes:
Natural Finish, per doz. $7.50@7.75
Pol. Blade..... per doz. $8.00@8.15
Painted or Bronzed..per doz. $8.00
Weed and Bush..per doz. $7.25@7.50

Scythe Snaths—

See *Snaths, Scythe.*

Seeders—

Raisin—

Enterprise..... ..... 25@30%

Sets—

Awl and Tool—

Brad Awl and Tool Sets:
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools.... doz. $2.50@2.60
Aiken's Sets, Awl and Tools:
No. 20, ₱ doz. $10.00..... 50&10&10%
Fray's Adj. Tool H dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... 50%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No 5, $18 .... 15&10%
Stanley's Excelsior:
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50..... 30&10&10&10%

Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe.... ₱ doz.....$9.00

Nail—

Square.....per gro. $2 50
Round, Blk. and Pol., assorted..... gro. $1.80@2.50
Octagon.....gro. $4.25@4.75
Knurled, Good.....gro. $6.00@6.50
Buck Brothers..... 27½%
Cannon's Diamond Point, ₱ gr. $13..25%
Snell's Corrugated, Cup Pt..... 50%
Snell's Knurled, Cup Pt..... ....66⅔%

Rivet—

Regular list..... 70@70¢10¢5%

Saw—

Aiken's Genuine..... ₱ doz. $5.50@6.00
Aiken's Imitation ..... ₱ doz. $3.00@3.10
Atkin's Criterion..... 10%
Atkin's Adjustable..... 40%
Bemis & Call Co.'s Cross Cut..... 30%
Bemis & Call Co.'s Plate..... 20%
Bemis & Call Spring Hammer..... 30%
Disston's Star and Monarch..... 25%
Hammer, Bemis & Call Co.'s new Pat. 45%
Morrill's No. 1, $15.00..... 40&20%
Nos. 3 and 4, Cross Cut, $23.00. 40&20%
No. 5, Mill, $31.00..... 40&20%
No. 10, $15.50..... 40&20%
No. 11, $16.00..... 40&20%
Taintor Positive, ₱ doz. $18 ..... 60%

Sharpeners Knife—

Chicago Wheel & Mfg. Co..... 60@65%
Smith & Hemenway Co ..... 70&5%
Tanite Mills ₱ gross, $14.40....35@33⅓%

Sharpeners, Skate—

Eureka Skate Sharpener.....₱ doz. $2.00

Shaves Spoke—

Iron.....doz. $1 00@1 25
Wood.....doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.).....50&10%
Goodell's, ₱ doz. $9.00..... 15&10%

Shears—

Cast Iron... 7 8 9 in.
Best .....$16.00 18.00 20.00 gro.
Good.....$13.00 15.00 17 00 gro.
Cheap.....$5.00 6.00 7.00 gro.
Straight Trimmers, &c.:
Best quality, Jap..60¢10¢10@70¢5% Nickel.....60@60&5%
Fair qual. Jap..... 75¢10@80% " Nickel..... 70¢10@75%
Tailors' Shears..... 40@40¢10%
Acme Cast Shears..... 40@40&5%
Heinisch's Tailors' Shears..... 40@40&5%
Wilkinson's Hedge..... 50%
Wilkinson's Sheep..... 1900 list, 50%

Tinners' Snips—

Forged Handles, Steel Blades..20¢10% Malleable Handles, Laid with Steel. 40%
Forged Handles, Steel Blades, Berlin.. 40&10%
Jennings & Griffin Mfg. Co's. 7 to 10 inch..... 50%
Niagara Snips..... 40%

Pruning Shears and Tools—

Cronk's Pruning Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00 25@25&10%
John T. Henry Mfg. Company
Pruning Shears all grades.....50&5%
Orange Shears..... 50&10%
Grape..... 50&10%
Tree Pruners..... 75%
Nagley's Pruning Shears....₱ doz. $8.00
P., S. & W. Co..... 33⅓@33⅓&10%

Sheaves—Sliding Door—

Stowell's Anti-Friction..... 50%
Patent Roller Hatfield's, Sargent's list, 80&10@80&10&7½
Reading..... 70&10@75%
R. & E. list..... 33⅓%
Wrightsville, Hatfield Pattern..... 80%

Sliding Shutter—

Reading list..... 70&10@75%
R. & E. list..... 33⅓%
Sargent's list..... 50&10⅔&10%

Shells—

Shells, Empty—

Brass Shells, Empty:
First quality, all gauges..... 60&5%
Climax, Club, Rival, 10 and 12 gauge.. 65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Smokeless, 10, 12, 16 and 20 gauge. 33⅓&10%
Blue Rival, New Climax, Primrose Club, Yellow Rival, 10, 12, 16 and 20 gauge..... 15%
Climax, Club, League, Rival, 14, 16 and 20 gauge (₱7.50 list)..... 20&5%
Climax, Club, League, Rival, 10 and 12 gauge..... 25&5%
Defiance, High Base, New Victor, Nitro, Repeater, 10, 12, 16 and 20 gauge..... 15%
Trap and Metal Lined, 10, 12, 16 and 20 gauge..... 33⅓&10&5%

Shells, Loaded—

Loaded with Black Powder..... 40¢5%
Loaded with Nitro Powder..... 40¢10¢10¢5%

Shoes, Horse, Mule, &c.—

Factory Shipments.

Carloads, f. o. b., Pittsburg.....$3.50
Less than Carloads, f. o. b., Pittsburg $3.55
Steel Shoes, 25c. per keg less
Burden's, all sizes, ₱ keg..... ..$3.60

Shot—

Drop, up to B, 25-lb. bag...$1.50@1.60.
Drop, up to B, 5-lb. bag ..... .55
Buck, 25-lb. bag.... .....$1.55@1.65
Buck, 5-lb. bag ..... .40
Chilled, 25 lb. bag..... ..$1.60@1.68
Dust Shot, 25-lb. bag.....$2.00@2.10
Dust Shot, 5-lb bag..... ... .50

Shovels and Spades—

No. 2, Polished, Sq. or Rd. Point, D or L Handle:

	A1, 1st Grade.	B2, 2d Grade
Plain Back	$10 50	$9 60
Strap Back	9.90	9.00
Cleveland Pat'n	10.20	9.30
	C3, 3d Grade.	D4, 4th Grade
Plain Back	$8.70	$8.10
Strap Back	8.10	7.50
Cleveland Pat'n	8.40	7.80

All other sizes add 30c doz. Black deduct 30c doz.

Note.—The above are the regular Association prices to small retailers, but are often shaded by jobbers $0.50@1.00, and Common, Plain Back Shovels are generally sold by jobbers at $6.75@7.00.

Shovels and Tongs—

Brass Head.....60&5@60&10%
Iron Head.....60&5@60&10%

Sieves and Sifters—

Hunter's Imitation, gro. $11.00@12.00

Buffalo Metallic Blued, S. S. & Co., ₩ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

Eclipse.....₩ gr. $10.00
Electric Light.....₩ gr. $12.00
Hunter's Genuine.....₩ gr. $12.50
Shaker (Barler's Pat.) Flour Sifters, ₩ doz., $3.00.....90%

Sieves, Tin Rim—

Per dozen.

Inch	14	16	18	20
Black, full size	$0 95	.98	1.00	1.10
Plated, full size	$1.05	1.08	1.10	1.20
Black, scant	....	$0.78	.80	.83

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.

Mesh 12, Nested, doz.....$0.75@0 80
Mesh 20, Nested, doz..... .85@ .90
Mesh 24, Nested, doz..... 1.00@1.05

Sinks—

Cast Iron—

Standard list.....60@60&10%
NOTE.—*There is not entire uniformity in lists used by jobbers.*

Wrought Steel—

Columbus Galv'd and Enameled..60&5%
Columbus, Painted.....45%
L. & G. Mfg. Co., Galvanized.....50%
L. & G. Mfg Co., Enameled.....50%

Skeins, Wagon—

Cast Iron.....70&10@75&10%
Malleable Iron.....40&10@50%
Steel.....40@40&10%

Slates—

"D" Slates.....40@40&10%
Unexcelled Noiseless Slates.....60&10&10@60&10&10&10%
Wire Bound.....35@40&5%
Double Slates, add $1 case, net.

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling $ 2.00.....83⅓%

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Derby.....35&2½%
High Grade.....45&2½%
Jockey.....40&2½%
Trojan.....45&2½%
Yankee.....35&2½%
Yankee, Roller.....30&2½%
Covert's Saddlery Works:
Banner.....60&10%
Crown.....60&10%
Model.....60&10%
Triumph.....60&10%
W. & E. T. Fitch Co.:
Bristol.....40&10%
Empire.....50&5%
German.....40%
National.....50&5%
Perfect.....45%
Clipper.....50&5%
Champion.....40%
Security.....40%
Victor.....60&5%
Oneida Community:
Solid Steel.....65@65&10%
Solid Swive.....65&10@65&10&10%
Sargent's Patent Guarded.....60⅔&10%

Snaths—

Scythe.....45&5%

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Silver Plated—

Flat Ware.....50&10@60&10%

Miscellaneous—

German Silver.....60&10%

Springs—

Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in.....₩ doz. $1.10@1.25
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

Factory Shipments.

1¼ in and wider	Blk. Hf. Brt.	Brt. 4¼	4½	4¾c lb

Cliff's Bolster Springs.....35%
Cliff's Seat Springs.....₩ pair 55¢

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.....} *List Jan. 5, 1900*
Steel and Iron.....} .....70@75%
Rosewood Hdl. Try Square and T-Bevels.....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels.....40&10@40&10&10%
Disston's Try Sq. and T-Bevels.....60&10%
Winterbottom's Try and Miter.....50&10%

Squeezers—

Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50; *No. 1,* $6.25@$6.50.
Wood, Porcelain Lined:
Cheap.....*doz.* $2.00@2.75
Good Grade.....*doz.* $3.00@3.50
Tinned Iron.....*doz.* $0.75@1.25
Iron, Porcelain Lined doz. $2.90@3.25
Jennings' Star.....₩ doz. $1.85@1.90
King.....₩ doz. $2.00

Staples—

Barbed Blind.....*lb.* 8¼@8¼c
Electricians', Association list..75&10%
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting. Staples....*per lb.*.. 4@4¼c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....40%
Foster Bros'.....30%
C. & A. Hoffmann's.....40%

Steelyards.....25@25&10%

Stocks and Dies—

Blacksmiths'.....40@40&10%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%
Curtis Reversible Ratchet Die Stock.25%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $10.80 per gro., 12 inch, $12.00
Cleveland Stone Co., list Nov., '92..83⅓%
Pike Mfg. Co., list '95-'96.....83⅓%

Oil Stones, &c.

Chicago Wheel & Mfg. Co.:
Corundum Oil, Double Grit.....80%
Corundum Axe Stones, Slips, etc.....55%
Pike Mfg. Co.:
Hindostan No. 1, ₩ b...8¢
Sand Stone.....5¢
Turkey Oil Stone, Extra, 5 to 8 in.....80¢ } 83⅓@ 83⅓&10%
Turkey Slips.....$1.50
Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....50¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 5 to 5¼ in. $2.80
Arkansas Stone, No. 1, 5¼ to 5½ in. $3.50
} 33⅓%
India Oil Stones.....25%
Tanite Mills:
Emery Oil, ₩ doz. $5.00.....50@60%

Stoners—

Cherry—

Enterprise.....25@30%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₩ doz., No. 1, $10.00; No. 2, $11.00, 40&20%

Stops, Window—

Ives' Patent.....35&5%
Wilcox, Steel, per doz., $0.00.....50%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Strainers, Pump—

Diamond Joe Pump Strainers..per doz. 75¢

Straps, Box—

Cary's Universal, case lots.....30&10%

Stretchers, Carpet—

Cast Iron, Steel Points....*doz.* 55@65c
Socket.....*doz.* $1.75

Strops, Razor—

Smith & Hemenway Co.....70%

Stuffers, Sausage—

Miles' Challenge, ₩ doz. $90...50&50&5%
Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Tacks Brads, &c.—

List Jan. 15, '99.

Carpet Tacks, American...90&40@..%
American Cut Tacks.....90&30@..%
Swedes Iron Tacks.....90&40@..%
Swedes Upholsterers' Tacks.....90&10@..%
Gimp Tacks.....90&10@..%
Lace Tacks.....90&10@..%
Trimmers' Tacks.....90&30@..%
Looking Glass Tacks.....70&10@..%
Bill Posters' and Railroad Tack....90&10@..%
Hungarian Nails.....80&25@..%
Common and Patent Brads.70&10@..%
Trunk and Clout Nails...80&10@..%

NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&2½% on Standard Weights.****

Miscellaneous—

Double Point Tacks....90&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50&10@60%
See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. $3.20
Emerald, S. S. & Co.....60-gal., $4.00
Queen City S. S. & Co., 30-gal.....$3.50
Queen City S. S. & Co., 60-gal.....$4.25

Tapes, Measuring—

American Asses' Skin.....40&10@50%
Patent Leather.....25@50&5%
Steel.....40@40&5%
Chesterman's.....35@35&5%
Eddy's Steel.....40@40&5%
Eddy's Metallic.....33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30@30&5%

Thermometers—

Tin Case.....30@30&10%

Ties, Bale—Steel.

Standard Wire.....50&10&5%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6½ in. ₩ 1000..$10.00
Galv. Steel 5-32 x 8½ in. ₩ 1000..$11.00
Galv. Steel 5-32 x 11½ in. ₩ 1000 $12.00
Galv. Steel 5-32 x 15½ in. ₩ 1000 $14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

L. & I. J. White.....20@20&5%

Saw—

Atkins' new list.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Game—

Oneida Pattern.....70&10@75&10%
Newhouse.....45@50%
Hawley & Norcom.....65&5@70%
Victor (Oneida Pattern).....75@75&10%
Star (Blake Pattern).....65&10@70&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes...8½c
Mouse, Round or Square Wire..... *doz.* $0.85@1.00
Diamond Joe Mouse Traps....per doz. 60¢
Diamond Joe Rat Traps.....per doz. $1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½;. ₩ doz. $12.00
No. 3, Rat, ₩ doz. $.6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₩ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₩ doz. $3.50; case of 72 $3.75 doz.
No. 5, Mouse, ₩ doz. $2.75;..case of 72 $2.90
Schuyler's Rat Killer, No. 1, ₩ gr. $30.00; No. 2, ₩ gr. $20.00; Mouse, No. 3, $18.00.....50%

Fly—

Balloon, Globe or Acme..... *doz.* $1.15@1.25 ; *gro.* $12.00@14.00
Harper, Champion or Paragon.... *doz.* $1.25@1.40 : *gro.* $13.50@15.00

Trimmers, Spoke—

Bonney's Nos. 1 and 2.....40%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....40%
Never-Break Steel Garden Trowels.....gro. $7.00
Peace's Plastering.....30%
Woodrough & McFarlin, Pl'st'ring..25&10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Daisy Stove Trucks, Improved pattern.....₩ doz. $21.00
Model Stove Trucks.....₩ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	$5.00	5 50	6.00

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz	$5 25	6.00	6.75	6.50	7.25	8.00

Twine—Binder—

Small lots f. o. b. New York, Philadelphia or Boston.
White Sisal, 500 ft. to lb. per lb. 7¼@7½c
Standard, 500 ft. to lb....per lb. 7¼@7½c
Manila, 600 ft. to lb.....per lb. 9@9½c
Pure Manila, 650 ft. to lb. per lb. 10½c
For carloads deduct ¼c per lb.

Miscellaneous—

	BC	B.
Flax Twine—		
No. 9, ¼ and ½-lb. Balls	22c	26c
No. 12, ¼ and ½-lb. Balls	18c	21c
No. 18, ¼ and ½-lb. Balls	16c	19c
No. 24, ¼ and ½-lb. Balls	15½c	18½c
No. 36, ¼ and ½-lb. Balls	15c	18c

Chalk Line, Cotton, ½-lb. Balls..... 22@22½c
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....7@8c
Cotton Wrapping, 5 Balls to lb..... 10¼c@..
American 2-Ply Hemp, ¼ and ½-lb. Balls.....12@13c
American 3 Ply Hemp, 1-lb. Balls.. 12@13c
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....9c
India 3-Ply Hemp, 1-lb. Balls.....9c
India 3-Ply Hemp, 1½-lb. Balls.... 8c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls... 10@10½c
Mason Line, Linen, ½-lb. Balls...35c
No. 36½ Mattress, ¼ and ½-lb. Balls.37c
Wool.....7c

Vises—

Solid Box.....50%
Bonney's Saw Vises.....40&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40&10%
Fisher & Norris Double Screw....15&10%
Hollands':
Machinists'.....40%
Keystone.....70%
Lewis Tool Co.....20@30%
Massey's Perfect.....15@20%
Massey's Clincher.....30@40%
Merrill's.....20%
Miller's Falls.....low list 10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....40%
Simpson's Adjustable.....40%
Snedliker's X. L.....20@25%
Stephens'.....20@25%
Van, W. & W. Hdw. Co.....40%

Saw Filers—

Bonney's, No. 1, $13; No. 3, $16 .50&10%
Disston's D 9 Clamp and Guide, ₩ doz. $30.....25%
Reading.....40&10%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....30&10%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%

Wads—Price Per M.

B. E., 11 up	.60c
B. E., 9 and 10	.70c
B. E., 8	.80c
B. E., 7	.80c
P. E., 11 up	$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B. E., 11 and larger	$1.70@1.75
Ely's P. E., 18 to 20	$2.00@2.25

Dis. 20&5%

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—

S. S. & Co. Reduced List.....40%

Cast Iron, Hollow—

Stove Hollow Ware:
Ground.....65%
Unground.....70%
White Enameled Ware:
Maslin Kettles.....80%
Boilers and Saucepans.....80&10%
Tinned Boilers and Saucepans.....60&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware, list July '99..35%
Granite Ware, list Jan. 1, '94, revised Jan. 2, '95.....40&10%
Second Quality, Agate Nickel Steel..65%
Second Quality, Granite.....70&10@70&10&10%
Iron Clad:
Peppered Ware, high list.....70%
Mottled Ware, high list.....75%
Never Break Enameled....80&5@80&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45c	50c	55c	65c

Steel Hollow Ware.

Avery Spiders & Griddles.....65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles.....65@65&5%
Never Break Kettles.....60@60&10%
Solid Steel Spiders & Griddles.....65&5%
Solid Steel Kettles.....60%
Solid Steel Ware, Enameled.....50&5%

Washboards—

Solid Zinc: ₩ doz
Crescent, family size, bent frame..$3.00
Red Star, laundry size, stationary protector.....$4.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.65
Wilson, family size, bent frame...$2.75
Single Zinc Surface:
Naiad protector, family size, open back peforated.....$2.40
Saginaw lobe, protector, family size, ventilated back.....$2.95
Wilson, bent frame family size, ventilated back.....$2.95

Washers—

Leather, Axle—

Solid.....80¢10¢10@85%
Patent.....85¢10@85¢20%
Coil: ¾ 1 1¼ 1¾ *Inch.*
11c 12c 13c 15c *per 100*

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.60 4.70 3.10 3.20 3.00
In lots less than one keg add ¼c per lb., 5-lb. boxes add ½c to list.

Cast Washers—

Over ⅛ inch, barrel lots. per lb.....
1¼@1¾c

Washer Cutters—

See *Cutters, Washer.*

Washing Machines—

See *Machines, Washing.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Oil Finish.....lb. 3¼c

Weights, Sash—

Per ton.....$40.00@43.50

Well Buckets, Galvanized

See *Pails, Galvanized.*

Wheels Well—

8-in., $1.65@1.75; 10-in., $2.00@2.10; 12-in., $2.50@2.75; 14-in., $3.25@3.40

Wire and Wire Goods—

Brt. and Ann., 6 to 9.....70¢10%
Brt. and Ann., 10 to 13.....72½¢5%
Brt. and Ann., 19 to 26.....75¢7½%
Brt. and Ann., 27 to 36....75¢10¢2½%
Cop'd and Galv., 6 to 9.....60¢5¢5%
Cop'd and Galv., 10 to 13.....70%
Cop'd and Galv., 19 to 26.....70¢10%
Cop'd and Galv., 27 to 36.....72½¢5%
Tinned, 6 to 14.....70¢10¢5%
Tinned, 15 to 18.....70¢5¢5%
Tinned, 19 to 26.....70%
Tinned, 27 to 36.....65¢10%
Annealed Wire on Spools..70¢5@70¢10%
Brass and Copper Wire on Spools..
60¢5@50¢10%
Brass, list Feb. 26, '98.....25%
Copper, list Feb. 26, '98.....15%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $, 40%
Wire Clothes Line, *see Lines.*
Wire Picture Cord, *see Cord.*

Bright Wire Goods—

Iron and Brass, list July 1, 1899....
85¢10@..%

Wire Cloth and Netting—

Galvanized Wire Netting.30¢20@35%
Painted Screen Cloth per 100 ft.....
$1.00@$1.05

Light Hardware Grade:
2-8 Mesh, Plain (8c. list) sq. ft..
1¼c
2-8 Mesh, Galv. (8c. list) sq. ft...
2¾c

Wire Barb—See *Trade Report.*

Wire, Rope—See *Rope, Wire.*

Wrenches—

Agricultural.....70¢10@75%
Case lots.....75¢10%
Baxter's S.....60¢10%
Coes' Genuine.....40¢10¢5¢5%
Coes' "Mechanics'".....40¢10¢10¢5¢5%
Acme.....60¢10%
Alligator.....60¢10¢10%
Bemis & Call's:
Adjustable S.....35¢2½%
Adjustable S Pipe.....40%
Brigg's Pattern.....50¢10%
Combination Black.....40¢5%
Combination Bright.....40%
Cylinder or Gas Pipe.....50%
Extra Heavy.....40%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....50%
Bindley Automatic.....50%
Boardman's.....35¢2½%
Bull Dog, W. & B.....50¢10¢10%
Donohue's Engineer.....40¢10%
Eagle.....50¢10%
Gem Pocket.....50%
Hercules.....70%
Solid Handles, P. S. & W.....50¢10%
Stevenson.....60¢10¢10%

Wrought Goods—

Staples, Hooks, &c., list March 17 '98.....35¢10@35¢25%

Yokes, Neck—

Covert Saddlery Works, Trimmed.60¢5%
Covert Saddlery Works, Neck Yoke Centers.....70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers & Freighters'... list nob

Zinc—

Sheet.....lb 6½@7c

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.

Lead, Foreign white, in Oil.. 7¼@ 9¼
Lead, American White, in Oil:
Lots of 500 lb or over.....@ 6¼
Lots less than 500 lb.....@ 7
Lead, White, in oil, 25 lb tin pails, add to keg price.....@ ¼
Lead, White, in oil, 12½ lb tin pails, add to keg price.....@ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price..@ 1½
Lead White, Dry in bbls.....5¾@ 6
Lead, American. Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry.....lb 4½@ 4¾
Zinc, Paris, Red Seal, dry.....@ 8½
Zinc, Paris, Green Seal, dry....@ 9¼
Zinc, Antwerp Red Seal, dry....@ 6¼
Zinc, Antwerp, Green seal, dry..@ 7¼
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over.....12 @12¼
Lots of less than 1 ton.....12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over.....10¾@11¼
Lots of less than 1 ton.....11@11¼
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2½; 50 bbls., 4%.

Dry Colors.

Black, Carbon.....lb 8 @20
Black, Drop, Amer.....2½@ 4
Black, Drop, Eng.....7 @11
Black, Ivory.....15 @21
Lamp, Com.....3 @ 5
Blue, Celestial.....lb 4 @ 6
Blue, Chinese.....30 @35
Blue, Prussian.....28 @34
Blue, Ultramarine.....30 @35
Brown, Spanish.....1½@ 1
Brown, Vandyke, Amer.....1¾@ 2½
Brown, Vandyke, Foreign.....2½@ 3½
Carmine, No. 40.....lb $2.05@2.75
Green, Chrome, ordinary.....5 @ 6
Green, Chrome, pure.....16 @20
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 lb or over.....@ 6
Lots less than 500 lb.....@ 6¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 lb or over.....@ 6
Lots less than 500 lb.....@ 6¼
Ocher, French Washed.....1¼@ 2½
Ocher, Dutch Washed.....4½@ 5
Ocher, American.....lb ton $10.00@15.00
Orange Mineral, English..lb 8½@11¼
Orange Mineral, French.....11½@11¾
Orange Mineral, German.....8¾@ 9¼
Orange Mineral, American.....7¾@ 8
Red, Indian, English.....4½@ 8½
Red, Indian, American.....3 @ 3½
Red, Turkey, English.....4 @ 6
Red, Tuscan, English.....7 @10
Red, Venetian, Amer., lb 100 lb. 80@1.10
Red Venetian, English.lb ...1.80@2.10
Sienna, Italian, Burnt and Powdered.....lb 3½@ 9½
Sienna, Ital., Raw, Powd.....3½@ 7½
Sienna, American, Raw.....1½@ 2
Sienna, American, Burnt and Powdered.....lb 1½@ 2
Talc, French.....lb 100 lb $1.95 @1.50
Talc, American.....90 @1.10
Terra Alba, French, lb 100 lb . 95 @1.00
Terra Alba, English.....95 @1.00
Terra Alba, American No. 1....85 @85
Terra Alba, American No. 2....45 @50
Umber, Turkey, Bnt. & Pow.lb 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer.....1½@ 2
Umber, Raw, Amer.....1½@ 2
Yellow, Chrome.....10½@25
Vermilion, American Lead.....10 @25
Vermilion, Quicksilver, bulk..@67
Vermilion, Quicksilver, bags...@68
Vermilion, English, Import..80 @95
Vermilion, Chinese.....$1.00@1.20

Colors in Oil.

Black, Lampblack.....12 @14
Blue, Chinese.....36 @40
Blue, Prussian.....32 @36
Blue, Ultramarine.....13 @16
Brown, Vandyke.....9½@13
Green, Chrome.....10 @12
Green, Paris.....@24
Sienna, Raw.....10 @13
Sienna, Burnt.....10 @15
Umber, Raw.....9½@12
Umber, Burnt.....9½@12

Miscellaneous.

Barytes, Foreign, lb ton....$19.00@21.00
Barytes, Amer. floated.....19.00@20.00
Barytes, Crude.....9.00@10.00
Chalk, in bulk.....lb ton 2.50@ 2.75
Chalk, in bbls.....lb 100 lb ..@ 85
China Clay, English..lb ton 12.00@17.50
Cobalt, Oxide.....lb 100 lb 2.20@ 2.50
Whiting, Common. lb 100 lb .42@ .52
Whiting, Gilders.....54@ .64
Whiting, extra Gilders'....58@ .68

Putty.

In bulk.....$1.90
In bladders.....2.40
In cans, 12 lb to 25 lb.....3.50
In cans, 1 lb to 5 lb.....3.60

Spirits Turpentine.

In Southern bbls.....@41¢
In machine bbls.....@41½¢

Glue.

Low Grade.....lb 12 @15½
Cabinet.....13½@16½
Medium White.....14½@16½
Extra White.....18 @23
French.....12 @40
Irish.....13½@16

Animal, Fish and Vegetable Oils.

Linseed, City, raw.....lb gal. 60@61
Linseed, City, boiled.....62 @63
Linseed, State and West'n, raw 64 @65
Linseed, raw Calcutta seed.....@65
Lard, Prime.....66 @67
Lard, Extra No. 1.....50 @55
Lard, No. 1.....41 @43
Cotton-seed, Crude.....27½@28
Cotton-seed, Summer Yellow, prime.....30½@31
Cotton-seed Summer Yellow, off grades.....30 @30½
Sperm, Crude.....@ ..
Sperm, Natural Spring.....@ ..
Sperm, Bleached Spring.....@ ..
Sperm, Natural Winter.....56 @57
Sperm, Bleached Winter.....61 @62
Whale, Crude.....@ ..
Whale, Natural Winter.....@47
Whale, Bleached Winter.....@48
Menhaden, Crude, Sound.....26 @27
Menhaden, Light Strained.....32 @33
Menhaden, Bleached Winter...35 @..
Menhaden, Ex Bleached Winter 38 @39
Tallow, prime.....52 @54
Cocoanut, Ceylon.....5¼@ 6
Cocoanut, Cochin.....6¼@ 6¾
Cod, Domestic.....34 @35
Cod, Newfoundland.....36 @36
Red Elaine.....39 @..
Red Saponified.....lb 5½@ 5¾
Olive, Italian, bbls.....57 @61
Neatsfoot, prime.....52 @54
Palm, prime, Lagos.....lb 5¼@5½

Mineral Oils.

Black, 30 gravity, 25@30 cold test.....gal. 9¼@10¼
Black, 29 gravity, 15 cold test. 10½@11½
Black, summer.....9½@ 9¾
Cylinder, light filtered.....14½@17½
Cylinder, dark filtered.....11½@13½
Paraffine, 903-907 gravity.....12½@13½
Paraffine, 903 gravity.....11½@12½
Paraffine, 883 gravity.....9½@10½
Paraffine, red, No. 1.....13½@14½
In small lots ½¢ advance.

THE IRON AGE.

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CURRENT METAL PRICES.

JANUARY 23, 1901.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ lb; Square, 0.8¢ ₩ lb	
1 to 1½ in. round and square	₩ lb 1.70@1.80¢
1¼ to 4 in. x ⅜ to 1 in.....	
Refined Iron:	
1 to 1½ in. round and square.....	₩ lb 1.75@1.85¢
1¼ to 4 in. x ⅜ to 1 in.....	
1¼ to 4 in. x ¼ to 5-16.....	₩ lb 1.90@2.00¢
Rods—⅜ and 11-16 round and square.	₩ lb 2.10@2.20¢
Angles:	Cts ₩ lb
3 in. x ¼ in. and larger.....	2.00¢
3 to 3½ in. x 3-16 in.....	2.00¢
1¼ to 3 in. x ¼ in.....	2.10¢
1¼ to 2½ in. x 3-16 in and thicker.....	2.00¢
1 to 1¼ in. x 3-16 in.....	2.10¢
1 to 1¼ x ⅜ in.....	2.20¢
⅞ x ⅛ in.....	2 50¢
⅝ x ⅛ in.....	2.55¢
⅝ x ⅛ in.....	3.20¢
⅞ x 3-32 in.....	3.70¢
Tees:	
1 in.....	2.50¢
1¼ in.....	2.40¢
1½ in. and larger.....	2 30¢
Beams.....	2.25¢
Channels, 3 in. and larger.....	2.25¢
Bands—1¼ to 6 x 3-16 to No. 8.....	₩ lb 2.15¢
"Burden's Best" Iron, base price.....	₩ lb 3.15¢
Burden's "H. B & S. Iron, base price.....	₩ lb 2.95¢
"Ulster".....	₩ lb 3.60¢
Norway Bars.....	4 @4½¢
Norway Shapes.....	4½@4¾¢

Merchant Steel from Store—

	per lb
Bessemer Machinery.....	1.75 to 1.85¢
Toe Calk, Tire and Sleigh Shoe.....	2.00@2.50¢
Best Cast Steel, base price in small lots.....	7½¢
Best Cast Steel Machinery, base price in small lots.....	6 ¢

Soft Steel Sheets—

¼ inch.....	2¢	No. 14.....	2.50¢
8-16 inch.....	2.05¢	No. 16.....	2.60¢
No. 8.....	2 20¢	No. 18.....	2 90¢
No. 10.....	2.30¢	No. 20.....	3.30¢
No. 12.....	2.40¢	No. 22.....	3.40¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel.	R. G. Cleaned.
Nos. 14 to 16.....	₩ lb, 2.95.....	3.10¢
Nos. 18 to 21.....	₩ lb, 3.15.....	3.30¢
Nos. 22 to 24.....	₩ lb, 3.25.....	3.30¢
Nos. 25 and 26.....	₩ lb, 3.25.....	3.40¢
No. 27.....	₩ lb, 3.45.....	3.50¢
No. 28.....	₩ lb, 3.55.....	3.60¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....	₩ lb 10½¢
Patent Planished.....	₩ lb A, 10½¢; B, 9½¢, net.

Galvanized.

	R. B.
Nos. 10 to 16.....	₩ lb, 12¢
Nos. 17 to 21.....	₩ lb, 13¢
Nos. 22 to 24.....	₩ lb, 14¢
Nos. 25 to 26.....	₩ lb, 15¢
No. 27.....	₩ lb, 16¢
No. 28.....	₩ lb, 17¢
No. 29.....	₩ lb, 19¢
No. 30.....	₩ lb, 21¢

70@70&5% off

36 in. 1¢ ₩ lb higher.

Foreign Steel from Store—

Best Cast.....	₩ lb 15 ¢
Extra Cast.....	₩ lb 18 @ 20 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 13 ¢
German Steel, Best.....	₩ lb 10 ¢
2d quality.....	₩ lb 9 ¢
3d quality.....	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d quality.....	₩ lb 14 ¢
3d quality.....	₩ lb 12 ¢
R. Mushet's "Special"	₩ lb 46 ¢
" " Annealed.....	₩ lb 75 ¢
" " "Titanic"	₩ lb 19 ¢
Hobson's Choice XX Extra Best.....	₩ lb 35 ¢
Jessop Self Hardening.....	₩ lb 45 ¢
Seamans' "Nelson" Steel.....	40 ¢
Hobson's "Soho" Special Self-Hardening..	₩ lb 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per lb
Banca, Pigs.....	27¾@28¢
Straits, Pigs.....	27@27¼¢
Straits in Bars.....	28@28¼¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20.....	$6.75
IX, 14 x 20.....	8.25
Melyn Grade:	
IC, 14 x 20.....	6.25
IX, 14 x 20.....	7.75
Allaway Grade:	
IC, 14 x 20.....	5.50
IX, 14 x 20.....	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 .....108 lb.....	$4.85@4.90
IX, 14 x 20.....	6.95@7.00
IXX 14 x 20.....	7.20@7.25

American Terne Plates—

IC, 20 x 28.....	$9.50@10.00
IX, 20 x 28.....	11.25@12.00

Tin Boiler Plates, American—

IXX, 14 x 26.....112 sheets.....	$12.50
IXX, 14 x 28.....112 sheets.....	13.50
IXX, 14 x 31.....112 sheets.....	15.00

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

Ingot—

Lake.....	17¼@17¾¢
Ansonia grade Casting.....	16¾@17¼¢

Sheet and Bolt—

January 19, 1900. Net.

Prices, in cents per pound. Sheet 30 x 60.

	Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz., 25 to 50 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7½ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7½ lb.	Lighter than 8 oz.
	Ins.	Ins.	Ins.									
	30	72	.....	25½	25½	26¼	25¾	21¼	21¼	23½	26½	29½
	30	96	72	30	30	30	30	25	25	25½	29½	
	30	120	96	30	30	30	30	25	25	25½		
	36	72	.....	30	30	30	28	23½	23½	25½	30½	
	36	96	72	30	30	30	28	23½	23½	25½		
	36	120	96	30	30	30	28	23½	23½			
	36	.....	120	30	30	30	28	23½				
	48	72	.....	30	30	30	28	24	27½	30½		
	48	96	72	30	30	30	28	25½	25½			
	48	120	96	30	30	30	28	25½				
	48	.....	120	30	30	30	28	25½				
	60	72	.....	30	30	30	28	26½	31½			
	60	96	72	30	30	30	28	29½				
	60	120	96	30	30	30	28					
	60	.....	120	30	30	30	28					
	72	96	.....	30	30	30	28					
	72	144	96	30	30	30	30½					
	72	.....	144	32	32	32	30½					
	108	120	.....	32	32	32	29½					
	108	.....	120	32½	32½	32½						
wider than	108	144	.....	34½	34½	34½						
		.....	144	35½	35½	35½						

Bolt Copper, ⅝ inch diameter and over, ₩ lb 20¼¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of Sheet Copper required to cut them from.
Cold or Hard Rolled Copper, 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₩ lb advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb.....	24½¢
12 oz. and up to 14 oz. to square foot, ₩ lb.....	25½¢
10 oz. and up to 12 oz., ₩ lb.....	27½¢
Lighter than 10 oz. ₩ lb.....	30½¢

Circles less than 8 in. diameter, 2¢ ₩ lb additional.
Circles over 13 in. diameter are not classed as Copper Bottoms.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

List March 2, 1900.

Nos.	0000 to 3 Base	2	1	9 and 10	11 and 12	13
		⅛¢	¼¢	⅛¢ ₩ lb adv.		
Nos.	13	14	15	16		
	⅛¢	¼¢	½¢	1¼¢ ₩ lb adv.		
Nos.	17	18	19	20		
	1¼¢	2¢	2¼¢	3¾¢ ₩ lb adv.		

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Feb. 6, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	⅛	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	.....	.....	.....	.....	33	31	30	29	28	27	25	24
12	10	.....	.....	37	35	33	31	30	29	28	27	25	24
13	11	.....	.....	37	35	33	31	30	29	28	27	25	24
14	12	.....	41	37	35	33	31	30	29	28	27	25	24
15	13	.....	42	38	36	33	32	31	30	29	28	26	25
16	14	.....	43	39	37	34	33	32	31	30	29	26	25
17	15	.....	44	40	38	35	34	33	32	31	30	27	26
18	16	61	45	42	39	36	35	34	33	32	31	28	27
19	17	62	47	43	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	42	41	40	39	38	37	37	36
23	22	76	61	52	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	46	45	44	43	41	40	40	41
25	24	86	71	56	51	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	29	27	21	21	21	21	21	21	21	23	23	25	27	28¢₩lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

Brazed Brass Tubing.

(To No. 19, inclusive.) Feb. 26 1896

Brown & Sharpe's gauge standard.

	Per lb.
Plain Round Tube, ⅛ in. up to 2 in.....	$0.35
" " ¼ " " 3¼ "	.36
" " ⅜ " " 3½ "	.38
" " ½ " " 4½ "	.41
" " 5-16 " " 4½ "	.48
" " ⅝ " 5-16"	.65
" " ¾ " ¼"	1.00
" " 3-16 " 3-16"	1.50
" " ¼ "	
Smaller than ¼ inch.....	Special
3 inch and larger	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5 ..... 35%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass Wider than and including	in. 2 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24	in. 24 26
To No. 20 inclusive.	.22	.23	.25	.27	.29	.31	.33	.36
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39
Common High Brass. Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	in. 40
To No. 20, inclusive ..	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24.	40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.59	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.
Add ⅛¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 30%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gild'g bronze and copper
All Nos. to No. 10, inclusive....	$0.23	$0.27	$0.28
Above No. 10 to No. 16.....	.23¼	.27½	.28¼
No. 17 and No. 18.....	.24	.28	.32
No. 19 and No. 20.....	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.44	.46	.51
No. 29	.49	.49	.54
No. 30	.45	.49	.54
No. 31	.48	.52	.62
No. 32	.51	.55	.67
No. 33	.55	.59	.73
No. 34	.59	.63	.82
No. 35	.64	.68	.95
No. 36	.70	.74	1.30
No. 37	.76	.80	1.50
No. 38	1.00	1.04	1.70
No. 39	1.80	1.84	2.00
No. 40	2.00	2.00	3.25
	2.60	2.60	5.75

Discount, Brass Wire, 20%; Copper Wire, Net.
List November 16, '96.
Spring Wire, 2¢ ₩ lb advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net.....	20¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb net.	21¢

Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb

Western Spelter.....	4.55@4.80¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.

600 lb casks.....	7@7½¢
Per lb	7¾@7¾¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American Pig.....	4½@4¾¢
Bar.....	5¼@5½¢
Pipe.....	4¾¢
Tin Lined Pipe.....	12½¢..... 20% off
Block Tin Pipe.....	40 ¢..... 20% off
Sheet Lead, full rolls.....	7¢..... 20% off
Sheet Lead, cut.....	7½¢..... 20% off

Old Lead in exchange, 4½¢ ₩ lb.

Solder.

½ & ¼, guaranteed.....	18½@19 ¢
No. 1.....	14½@17 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson.....	₩ lb 11¢
Hallett's.....	₩ lb 9¾@10¢
U. S.....	₩ lb 9¾¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.

No. 1 Aluminum (guaranteed to be over 99% pure), in ingots for remelting:	
Small lots.....	₩ lb 37¢
100-lb lots.....	₩ lb 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:	
Small lots.....	₩ lb 34¢
100-lb lots.....	₩ lb 33¢

Aluminum Sheet, B. & S. gauge. 50 lb or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb
Nos. 13 to 19.....	$0.42	$0.44	$0.47
No. 20.....	.44	.46	.49
Nos. 21 to 23.....	.46	.48	.51
No. 24.....	.46	.50	.53
No. 25.....	.47	.51	.54
No. 26.....	.47	.54	.59
No. 27.....	.48	.57	.62
No. 28.....	.48	.57	.64
No. 29.....	.49	.60	.69
No. 30.....	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ lb 40¢	No. 15.....	₩ lb 43¢
No. 9 to No. 10..	₩ lb 40½¢	No. 17.....	₩ lb 50¢
No. 11.....	₩ lb 41 ¢	No. 18.....	₩ lb 55¢
No. 12.....	₩ lb 41½¢	No. 19.....	₩ lb 60¢
No. 13.....	₩ lb 42 ¢	No. 20.....	₩ lb 65¢
No 14	₩ lb 43½¢	No. 21.....	₩ lb 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper.....	₩ lb 14¼¢
Light and Tinned Copper.....	₩ lb 13¾¢
Heavy Brass.....	₩ lb 9 ¢
Light Brass.....	₩ lb 7½¢
Lead.....	₩ lb 4½¢
Tea Lead.....	₩ lb 3¾¢
Zinc.....	₩ lb 3 ¢
No. 1 Pewter.....	₩ lb 17 ¢
No. 2 Pewter.....	₩ lb 9½¢
Tin Plate Scrap.....	₩ ton $6.50
Wrought Scrap Iron.....	₩ gross ton $10 00@10.25
Heavy Cast Scrap.....	₩ gross ton $10 50@11.00
Stove Plate Scrap.....	₩ gross ton $7.00@ 7.50
Burnt Iron.....	₩ gross ton $5.00@ 5.50